VOLUME LVII NUMBER ONE

THE NATIONAL GEOGRAPHIC MAGAZINE

JANUARY, 1930

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TO carry out the purposes for which it was founded forty-two years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and has contributed $55,000 to Commander Byrd's Antarctic Expedition.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society has conducted extensive excavations at Pueblo Bonito, New Mexico, where prehistoric peoples lived in vast communal dwellings before the days of Columbus; it is sponsoring an ornithological survey of Venezuela, and is maintaining an important photographic and botanical expedition in Yunnan Province, China.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated $65,000 to enable the Smithsonian Institution to establish a station for five years on Mt. Brukkaros, in Southwest Africa.

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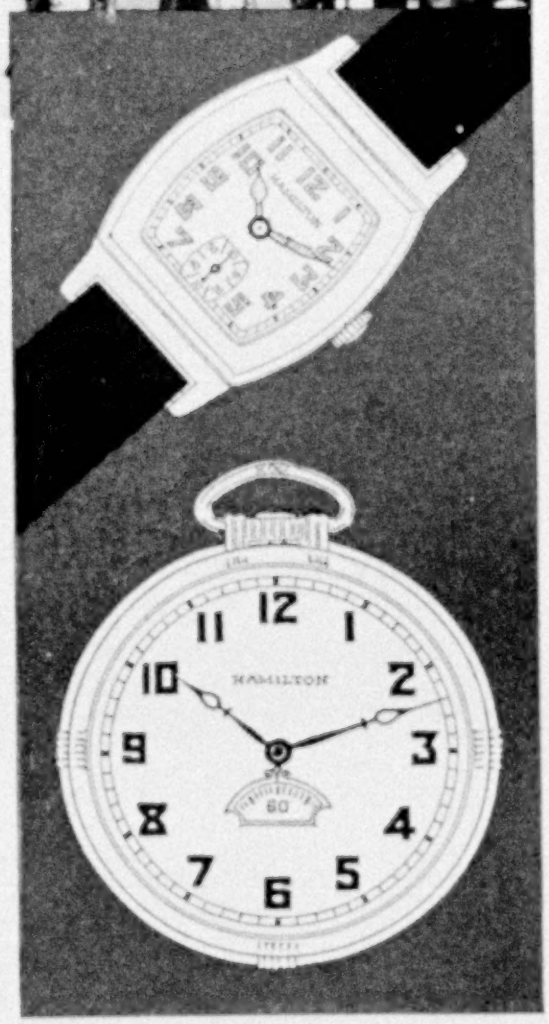

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You may learn a lesson from the time they carry!

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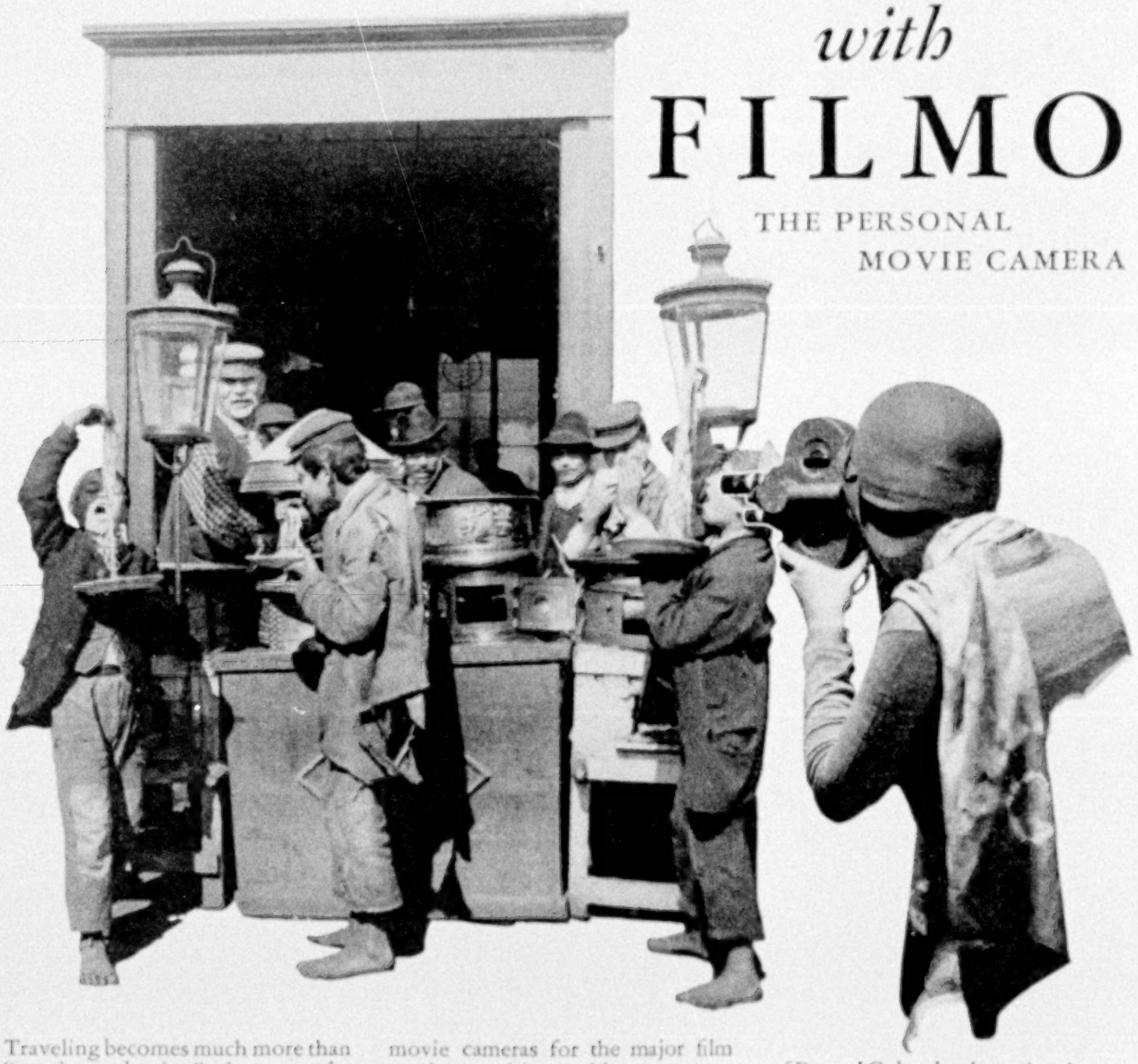

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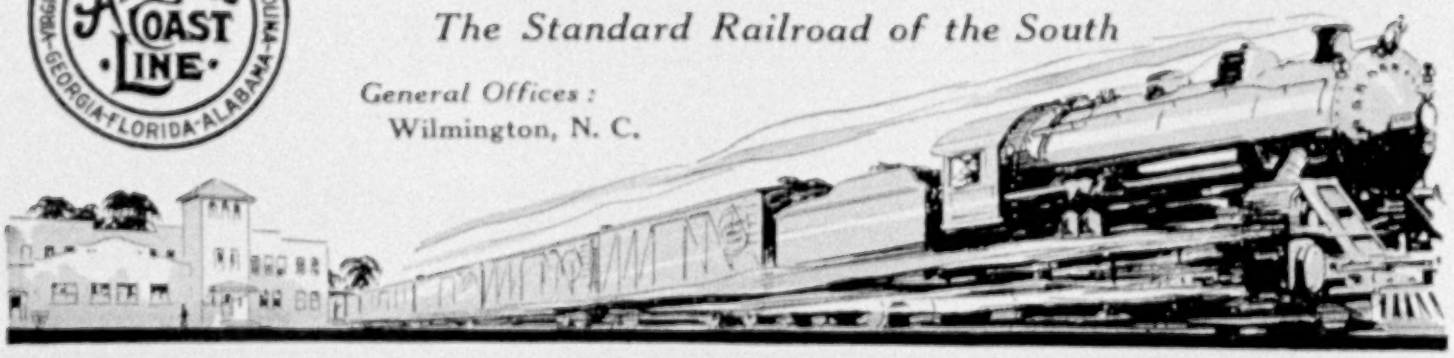

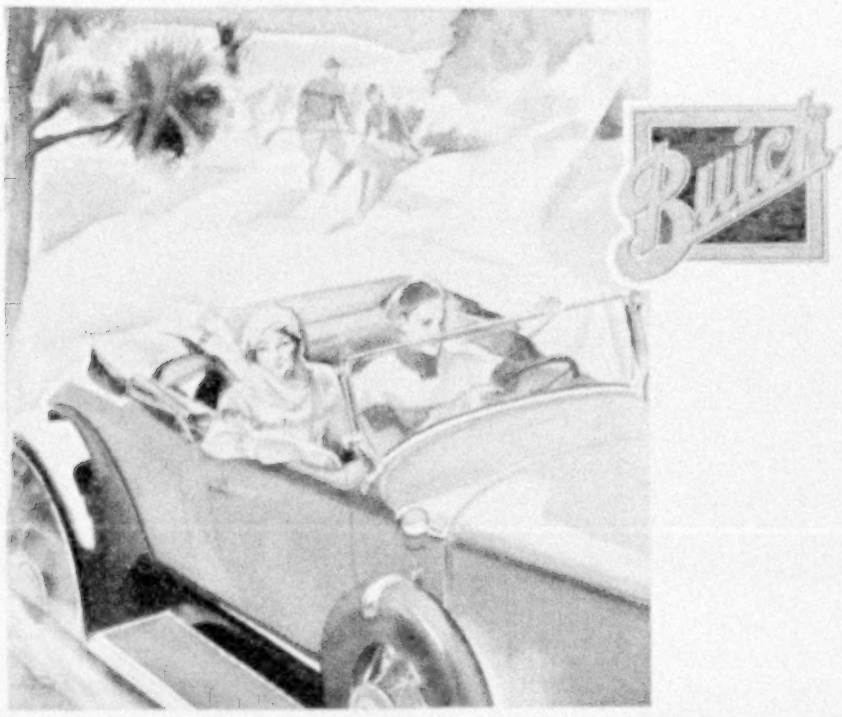

Day by day a great new BUICK *family is merging with the old . . . .*

The man who thrills to possession of his first Buick . . . and the man who as eagerly awaits delivery of his tenth . . . are as one in their praise of Buick.

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The world knows of no other motor car which enjoys such complete sales dominance in its price class together with such warm and widespread owner loyalty. And Buick owners, reflecting that loyalty, will tell you it is because there is no other motor car like Buick.

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Builders of
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You are paying for a Packard

Why not own one?

Just because the first cost of one automobile is lower than another it does not follow that operating and upkeep costs are lower. And the fact that a car costs twice as much at first does not mean that final cost is twice as great—it is *no greater* if the car is driven twice as long. Apply these facts to your present motoring costs and you will very likely find that you can enjoy the luxury of Packard transportation at no increase in expense.

CLEVELAND OWNERS FIND IT TRUE

Most operating and upkeep expenses differ but little as between a Packard Standard Eight and any car down to half its price. Gas, oil, tires and garaging cost virtually the same for either car, any place in the United States.

Repair expense for the Packard is naturally *less.* Packard's advanced motor and centralized chassis lubrication systems protect built-in precision—make frequent repair work unnecessary. Yet when repairs *are* needed they are quickly and economically made, due to Packard's simplicity of design.

The items of license and insurance, despite the higher value of the Packard, differ but little in the various states and cities.

In Cleveland, for example, license cost is the same, while the usual coverage for fire and theft, collision, property damage and personal liability runs but a few dollars more per year. The higher fire and theft rate for lower-priced cars accounts in great part for the fact that the total difference is so small.

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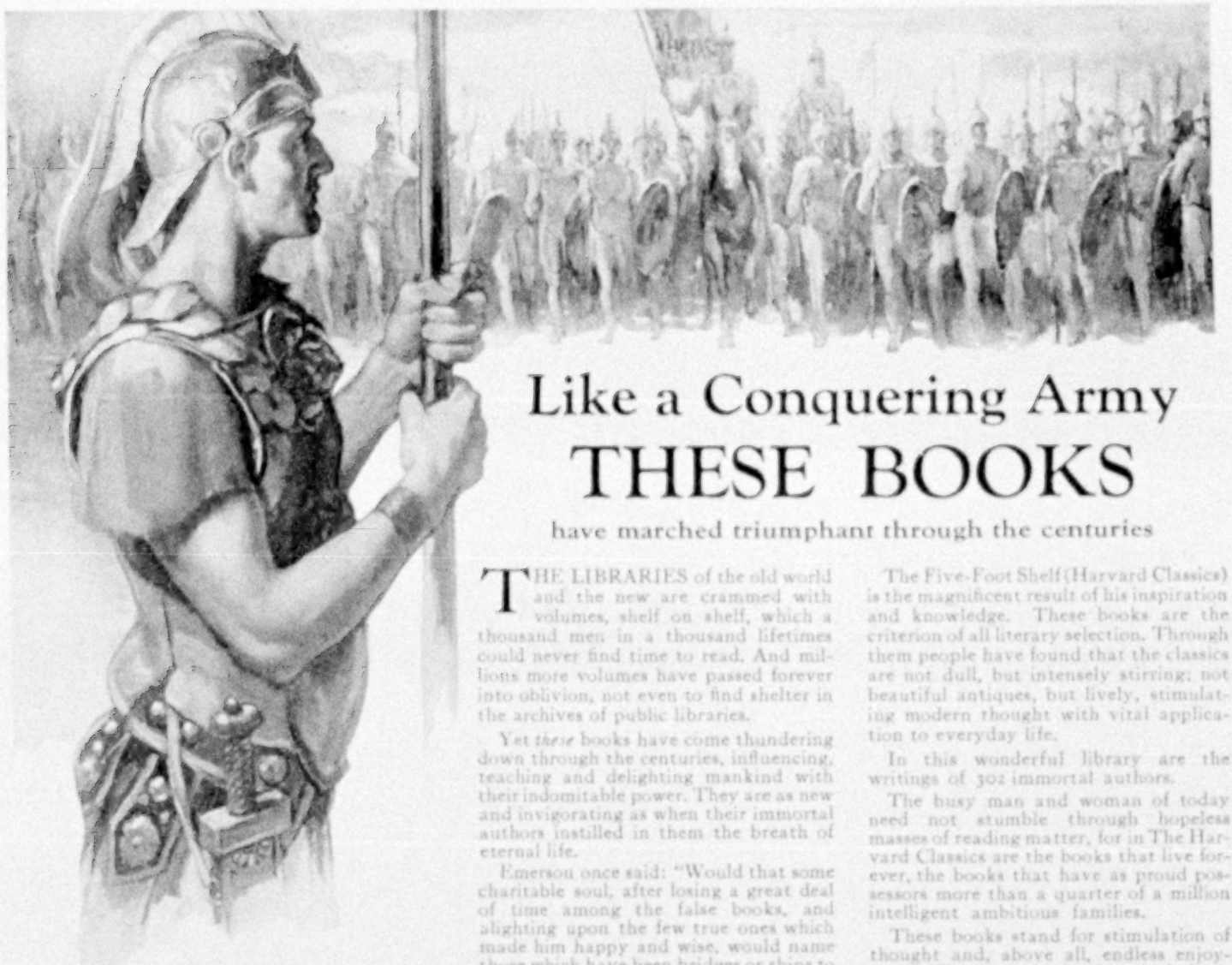
The Memory Stone



Like a Conquering Army
THESE BOOKS

have marched triumphant through the centuries

THE LIBRARIES of the old world and the new are crammed with volumes, shelf on shelf, which a thousand men in a thousand lifetimes could never find time to read. And millions more volumes have passed forever into oblivion, not even to find shelter in the archives of public libraries.

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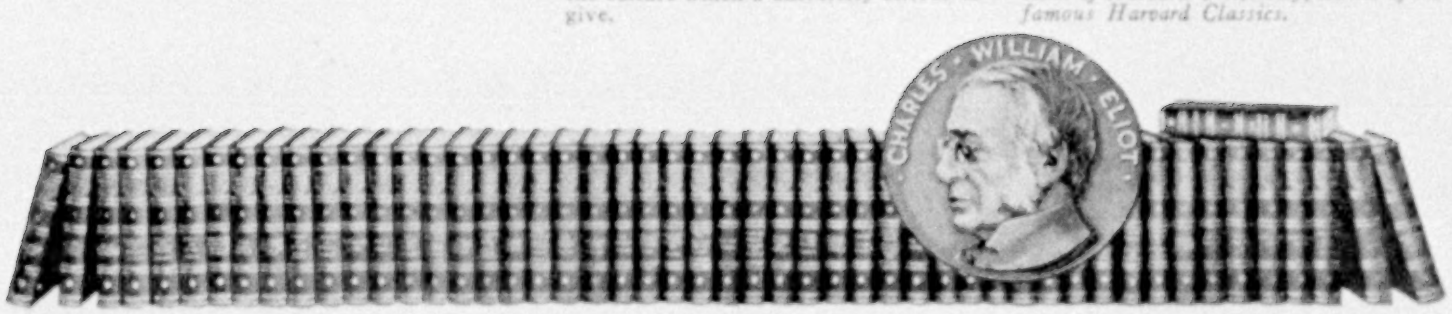

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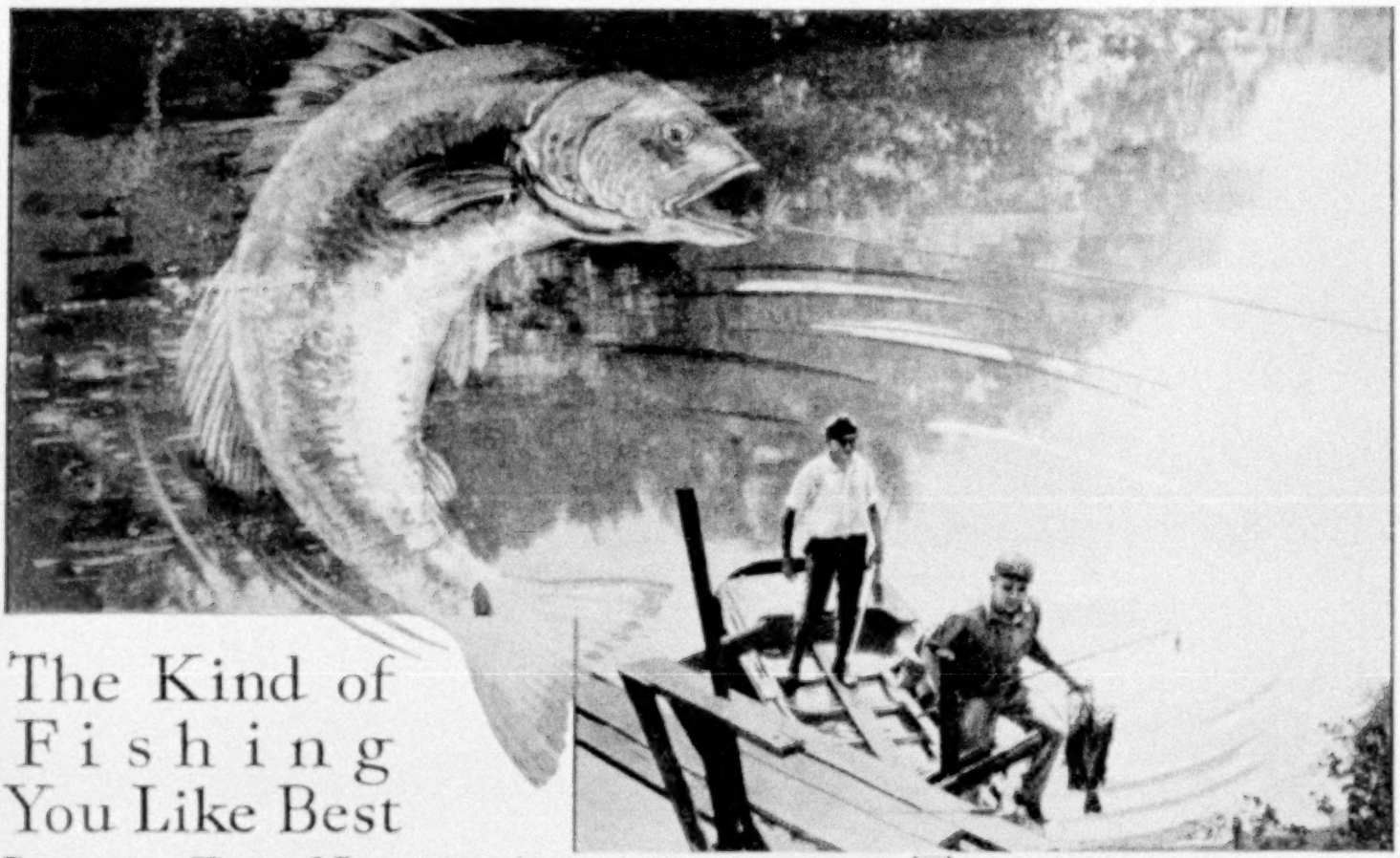

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Hundreds of fresh-water streams and lakes are full of trout, bass, and redfish, while the waters of the Gulf are alive with almost every kind of fish that swims the seas---Spanish mackerel, speckled trout, sheepshead, blackfish, and tarpon. Splendid and inexpensive accommodations are provided for the complete enjoyment of all kinds of outdoor sports---hunting; golf on perfect courses; swimming in outdoor pools (and in the surf on the warmer days); boating; horseback riding; motoring amidst the most beautiful of natural surroundings.

The Gulf Coast is a land of moderate climate and every day sunshine. An ideal place to recuperate and bring back red corpuscles to your blood.

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SPRING — IN THE MEDITERRANEAN

RAYMOND - WHITCOMB CRUISE

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Agents in the principal cities

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San Juan, Santiago, Santo Domingo, Port-au-Prince, St. Pierre, Fort de France, Barbados, Trinidad, La Guayra, Curacao, Colon, Kingston, Havana, Nassau, Bermuda.

Sailing Date from New York	Steamer	Duration of Voyage	Minimum Rates
Jan. 6, 1930	s. s. Carinthia	16 days	$200
Jan. 16, 1930	s. s. Caledonia	26 days	275
Feb. 15, 1930	s. s. Caledonia	26 days	275
Mar. 15, 1930	s. s. Caledonia	18 days	200
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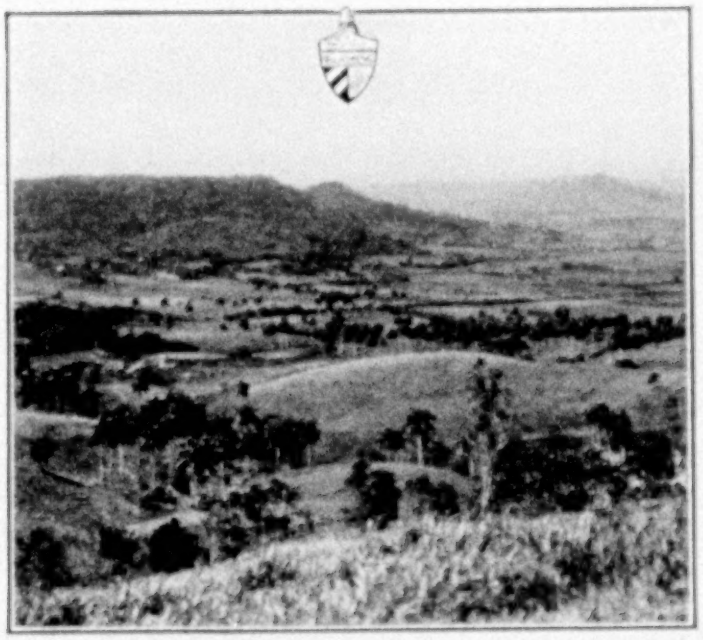

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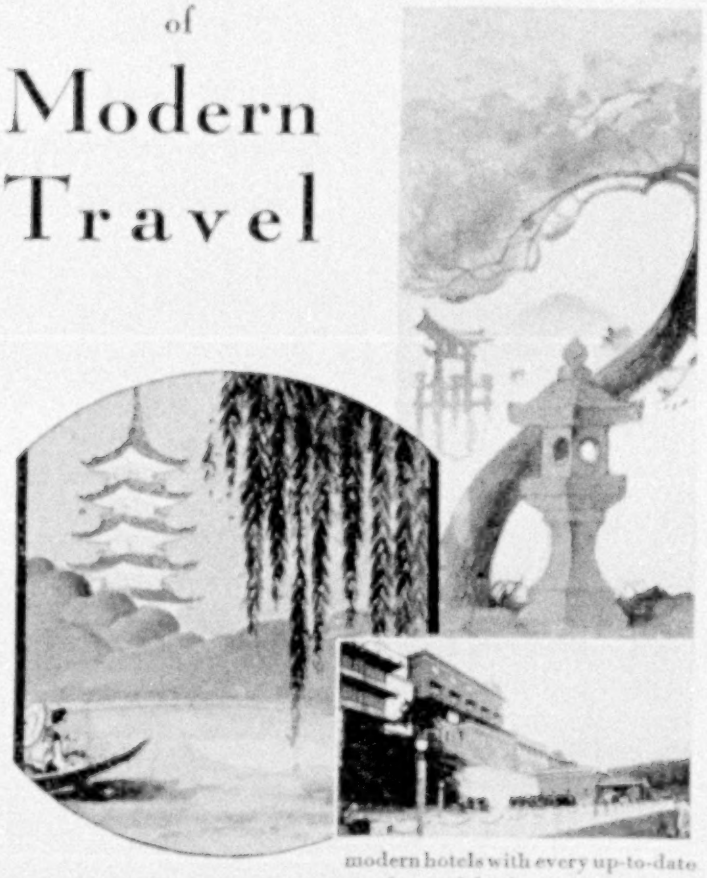

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PERHAPS you know the world is small—that in January there's more than one languorous breeze astir with whispers of forgetfulness. Maybe before this you have looked across a cafe table the Old World has fragranced.

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It surrounds you with a comfortable bit of the America you know—modern Pullmans, a dining car styled by Southern Pacific—and swiftly speeds you through the newest Old World. Mexico!—the little known, the little understood. A land of mysterious origin and vast antiquity. Still medieval, yet in many ways as new as tomorrow.

Come while it is unspoiled. Come before the sightseeing bus crowds out the ancient carriage—(even now the tractor crawls past the oxen and wooden plough). Dine under palms to the music of Old Spain; look out on a sun-filled sea that tumbles white to a lazy shore—before the sign goes up, tourist conscious, "Por Americano."

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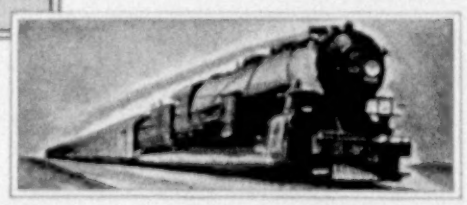

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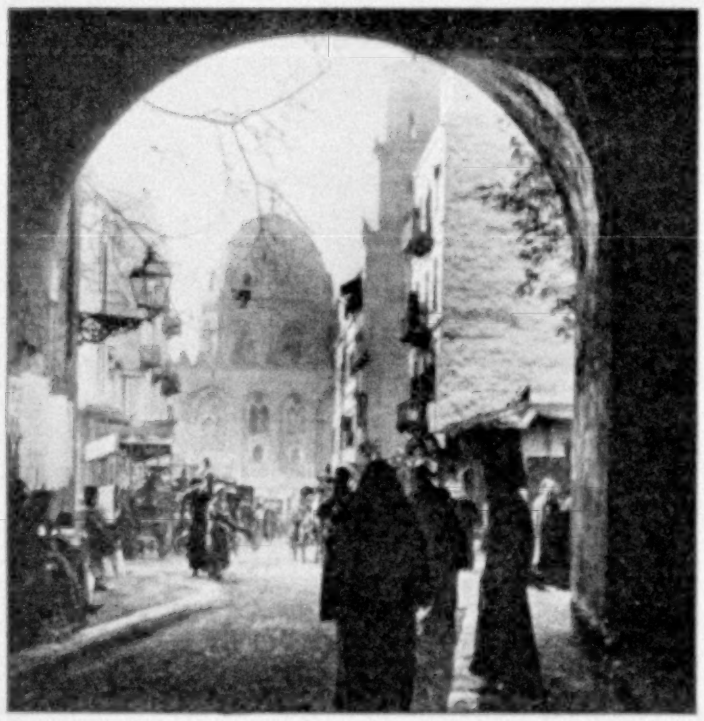

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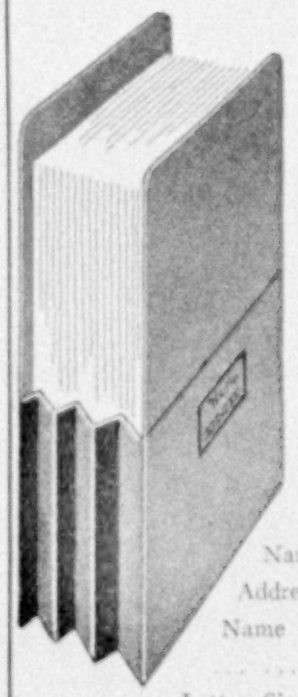

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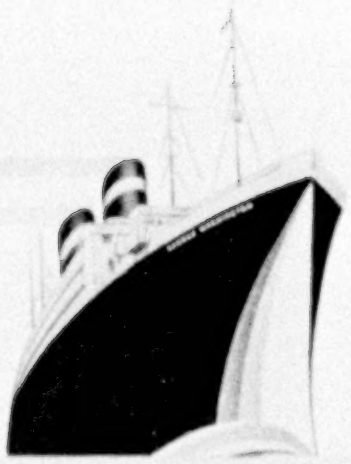

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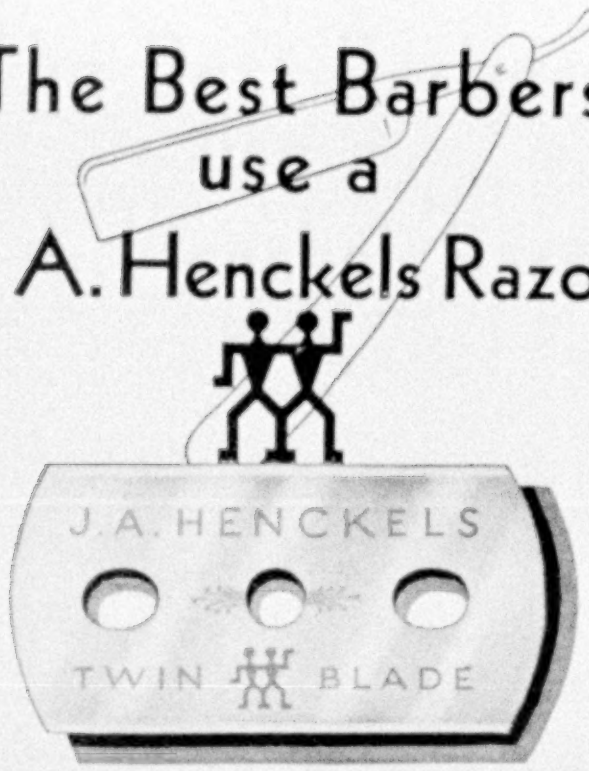

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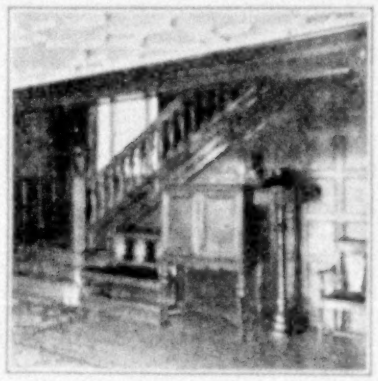

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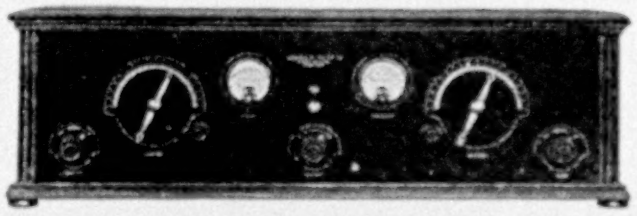

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Nowhere else on Earth does Spring pour her favors with such lavish hand . . . For each of Man's senses she gathers delights, distributes them in abundance . . . from luscious pineapples cool with morning dew from great island plantations, to the lilt of lapping waters when the touch of moonlight is on the land and Nature's cadence is caught in the strains of sobbing steel guitars. Each day the miracle is repeated. Each night the magic mystery is renewed.

Go this Spring. Let no worry of heat that comes with the wane of Winter in other lands disturb you. The cool delights of day give way to the cool comforts of night when the warmth of blanket is welcome. Hawaii is only four to six days away from the gateways of the Pacific on liners as proud as any that float. The trip itself is an epoch . . . a symphony of sun and sea and sky.

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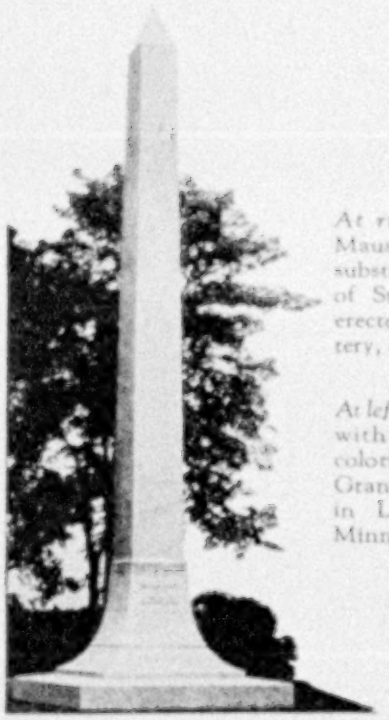
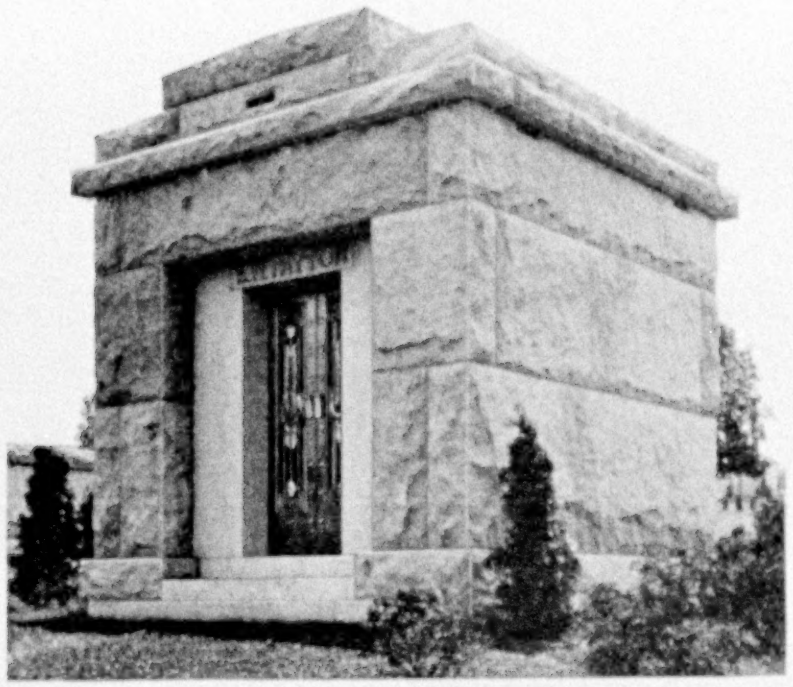
NEW visions, new plans come with the New Year. Visions and plans of permanently memorializing our loved ones by the erection of an everlasting Family Mausoleum or Memorial Tribute are in keeping with the finer things in human nature. If such plans interest you for this year, there are suggestions for you in the pages of "Modern Memorial Art." This valuable treatise will be mailed at your request.



At right: E. H. Patton Mausoleum, of rugged and substantial construction, of Stony Creek Granite, erected in Kensico Cemetery, New York City.

At left: Of striking beauty, with subdued, blended coloring, of Stony Creek Granite, the Eustis Shaft is in Lakewood Cemetery, Minneapolis, Minnesota.



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Rip Van Winkles

REMEMBER Washington Irving's lovable, irresponsible Rip Van Winkle? How persistently he tricked himself! Time and again when temptation was too strong and nature too weak, he would lift his glass and say, "I won't count this one".

© 1929 Metropolitan Life Insurance Co.

THERE are many Rip Van Winkles in the world right now—some are weak in self-control; some are sadly behind the times in a matter of vital importance to them. They are the unfortunates among the million diabetics in the United States today.

Old Rip's giant spree put him to sleep for twenty years—but "food sprees" are bringing death to present-day Rip Van Winkles because they lack self-control or lack knowledge as to what insulin can do for them.

Thanks to insulin, a diabetic is not confined nowadays to a scanty, spirit-breaking diet. He can have varied and much more appetizing food than was allowed in the old days. But even now, if he fails to find out what he should eat and drink—or if he fails to be steadfast in obeying orders—he practically commits suicide.

When diabetes attacks, it has come to stay. It rarely gives up. A diabetic has one of two choices, either to put up a cheerful, continuous fight or weakly surrender. Half-way defense spells defeat. But a courageous, unyielding fight is almost sure to win.

One great danger is that with the aid of insulin and correct diet, the diabetic feels so much better that he is lulled into a false sense of security. He takes liberties with his diet or neglects to take the insulin as directed. Then, with crushing swiftness, diabetes may claim another victim.

Thousands of diabetics are not even aware of the fact that they are in danger because they have not had a physical examination which would have revealed the presence of this old enemy of mankind and because, also, during most of its course, diabetes is painless.

Of the 20,000 deaths caused by diabetes last year in the United States, 8,000 were of the acute type ending in coma. Yet a world-famous specialist says, "Diabetic coma is always preventable and nearly always curable . . . Many of my patients have actually lived longer than would have been expected of them had they been normal, healthy people".

* * * *

The deathrate from diabetes is rising. It can be forced downward. The Metropolitan's booklet, "Diabetes," together with recently published information for physicians and their patients on prevention of diabetic coma, will be mailed free on request. Ask for Booklet 130-N.

METROPOLITAN LIFE INSURANCE COMPANY

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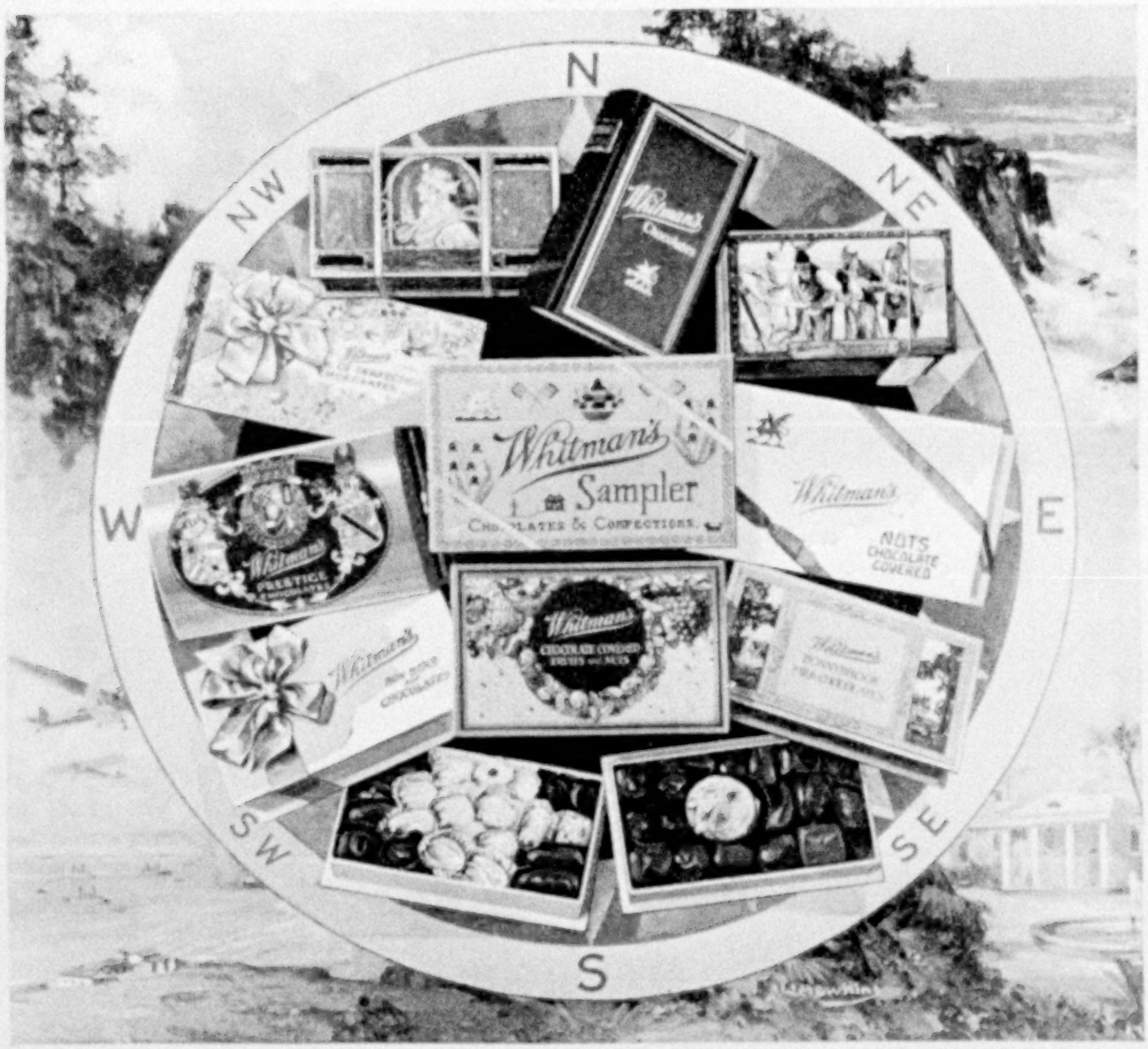

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Because of their popularity, Whitman's do not linger on the dealers' shelves. Success begets success. Every fresh and pleasing package sold increases the prestige of Whitman's. We take every possible care to see that the quality put into every package remains till the candy is eaten. Whitman's is the quality candy most called for—and is therefore freshest. Each package is doubly guaranteed—by us and by the dealer.

To send Whitman's quickly to distant points, step into the nearest Postal Telegraph office and file your order. A uniformed messenger will deliver the package.

Whitman's Chocolates & Confections

TO FIND DEALER LOOK UNDER "WHITMAN'S" IN THE BELL TELEPHONE CLASSIFIED DIRECTORY

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FLORIDA—THE FOUNTAIN OF YOUTH

By John Oliver La Gorce

Author of "Porto Rico, the Gateway of Riches"; "Jamaica, Isle of Many Rivers"; "Treasure House of the Gulf Stream"; "Pennsylvania, the Industrial Titan"; "Warfare on Our Eastern Coast," etc., in the National Geographic Magazine

THAT romantic figure of Spain's glorious days of New World discovery, Ponce de León, probably felt he had earned his golden spurs as an explorer when, as a companion of the Great Admiral on the second voyage, among other achievements, he was named governor and established settlements on the Isle of John the Baptist, which to-day we proudly call our very own Porto Rico.

So it was that Ponce besought his royal master in Spain to grant him the star of leadership to seek out and conquer new fields in the misty area of a continent yet to be cartographically born. That our gallant Ponce was romantic is evidenced by the latitude of his request, which, reduced to a few words, asked permission to find and claim for Spain the fabled Isle of Bimini, on which was thought to exist a gushing fountain of crystal water the discovery of which would be the greatest possible boon to mankind.

These miraculous waters, it was held, would do more than transmute metal, which for ages had been the alchemists' dream; better yet, they possessed the power to wash away the earthly years of man and forthwith restore to him the freshness and strength of youth!

Perhaps the gallant don's heart dilated with pride at the prospect, and his monarch bethought him that, as his personal milestones were moving apace, there might indeed be something to this legendary fountain, since equally amazing things were being discovered in this new world of his; therefore it was at least worth a try. Be that as it may, the royal permission was granted and in due course Ponce set sail into the unknown for many days.

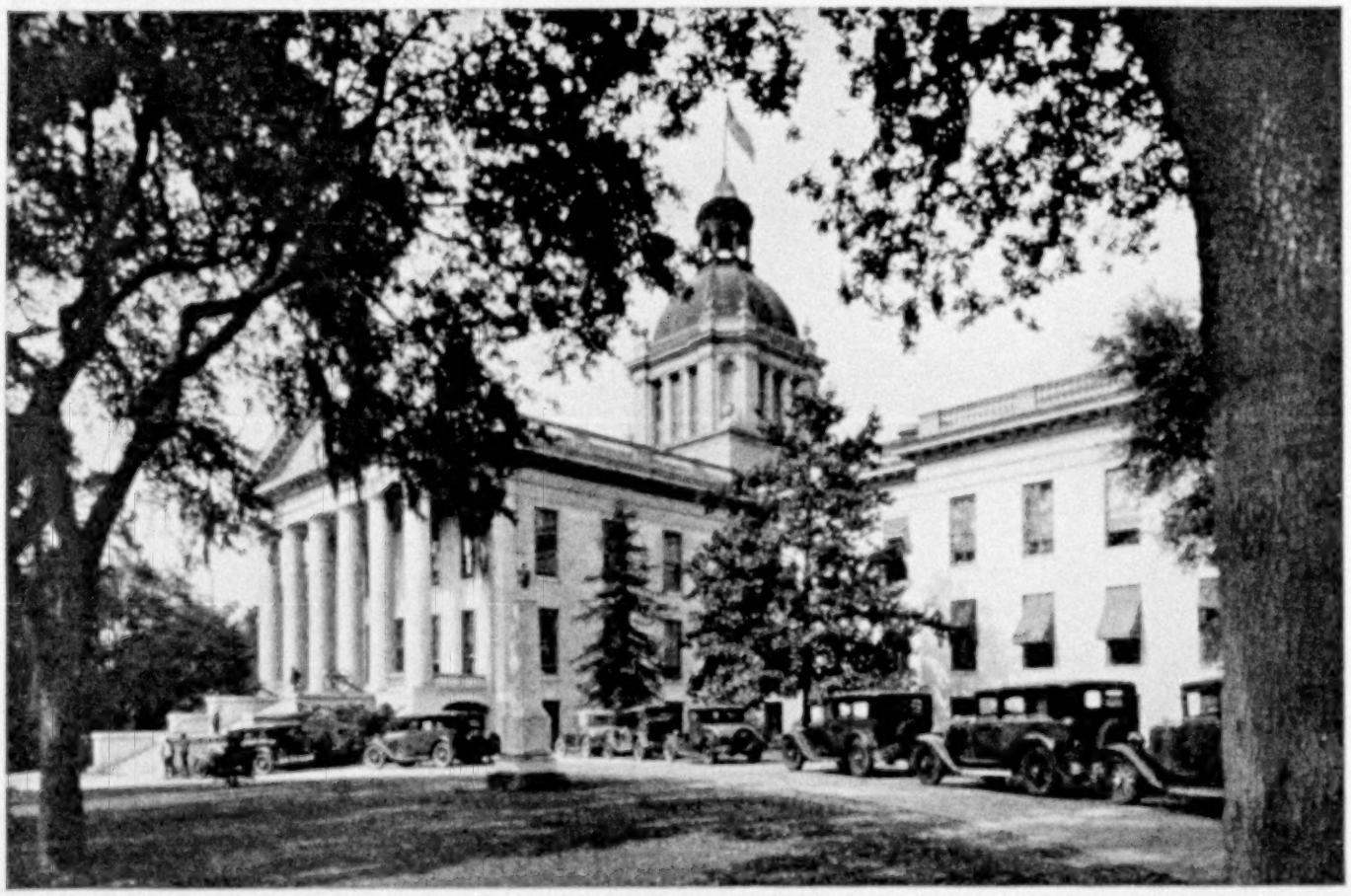
PONCE DE LEÓN FOUND HIS LAND OF FLOWERS

Finally he made his landfall one beautiful morning soon after Easter Sunday, in the year 1512, as many historians hold, and, casting anchor, went ashore with sword, cross, and royal decree, somewhere near the mouth of the placid St. Johns River, and gave his "island" the charming name of Florida.

Don Ponce may have missed his rejuvenating fountain, but surely he found something nearly as wonderful in a health-giving, and consequently life-prolonging, climate that centuries later, with the help of many minds and hands, has come into its own as the winter playground of the eastern half of our continent.

It is true that our Florida of to-day was hazily shown on the Cantino map of 1502, according to the records in the Archives of the Indies, an institution that still flourishes in the Andalusian city of Seville, but on that chart it was only a shadow, and we must, as do most historians, credit Ponce de León and his brave followers with first achieving the goal.

We need not dwell upon the hardships, battle, and sudden death encountered by



Photograph by Clifton Adams

THE FLORIDA CAPITOL SURROUNDED BY FAMOUS TALLAHASSEE OAKS

The new State House, begun in 1839 and completed in 1845, replaces the old log cabin which once stood in the southeast corner of the present grounds.

these Men of Iron, from Indian ambuscade, from the claws of wild beasts, and from insect stings, for the telling would fill a great volume, as would the trials of those who followed them a lifetime after, when Ribault and his Huguenots landed in 1562 and unfurled the standard of France. Lurid lines were ever being written across the historic page of fair Florida, as when Sir Francis Drake in 1586 and Capt. John Davis in 1665, with their "Hounds of Hell," as the dons called them, harried the coast in their adventurous trade of pillage and ransom.

So uncertain was life in a land where, though Nature smiled peacefully man was savage, that the Spaniards did not send forth successful inland settlement shoots from the eastern seaboard until the declining years of the 17th century. However, shortly after Ponce de León established his toehold on the seacoast of northern Florida another adventurous Spaniard, Don Diego Miruelo, appears to have skirted the west coast; but historians require him to give way as a real pathfinder to De Narváez, who, setting sail from Cuba, in 1528, landed somewhere near where the city of Pensacola to-day smiles a welcome to those who come seeking sunshine and comfort from the wintry North. There De Narváez and his several hundred fighters battled it out with Indians and unseen terrors for a few months, only to be defeated, and finally most of his dwindled command drowned while endeavoring to regain their base in some hurriedly constructed and unseaworthy craft.

Inasmuch as this is a bird's-eye view of the sovereign Commonwealth of Florida, we shall not dwell historically, but drive directly into the present, leaving the span between the 16th century and its romantic, if hard-bitten, background to our betters.

FLORIDA'S PLACE IN THE SUN

"You are now 375 miles south of Cairo, Egypt."

So reads a poster in a Key West hotel; and that fact provokes thought. It reveals why, on this pistol-shaped peninsula of Florida, we find some aspects of life

Photograph by George M. Chapin

THEY BUILDED WELL, THOSE MEN OF IRON

Old Fort Marion, St. Augustine, reflects the early type of Spanish coast defense, known throughout the West Indies, Latin America, and the Philippines.

and work akin to no other State of the Union.

"Climate," said Darwin, "makes a difference in the enjoyment of life." Sun makes climate, and climate, with the aid of trade winds, makes Florida. She tilts her sunburned nose so far down toward the Tropics that only here, in all the United States, can you pick coconuts from their lofty habitat—that is, if you climb well!

Her map spot in the sun gives Florida an odd character. It makes her, economically speaking, dual-faced, and men who do not know her well may misjudge her, because, with two distinct natures, it is hard to see her as a pulsing whole.

On one side, the real Florida: vast, sparsely settled, strewn with fruit and farm colonies, cow ranches, sawmills, turpentine stills, seaports, cigar factories, smelly fisheries, and industries that produce, among other things, in commercial quantities, fuller's earth, kaolin, titanium oxide, and—be it proudly said—about 85 per cent of this country's supply of phosphate rock.

On the other side, familiar to winter visitors, a strangely different State. Through long, dull months she drowses and suns herself; yet from December to the Ides of March, gay, boisterous, and bizarre, she affords an astounding spectacle of massed humanity, idle, yet often athletically active, probably without parallel anywhere.

Pilgrim hordes marching to Mecca, the Moors overflowing into Spain, Chinese streaming into Manchuria—such are among the world's migratory phenomena. But the tourist trek to Florida is unique; for, lured by sun, sea, and the instinctive love of outdoors, people turn toward Florida each winter, at which time her population almost doubles.

MASS MIGRATION

By train, motor, boat, and plane this army comes. One even sees walkers and men on bicycles, a suitcase lashed atop the handlebars. Through Lake City and Jacksonville, more than a motor car a minute, by actual daylight count, during the early months of northern winter.

A graphic picture this, a giant movie-

NOT ALONE IN ST. AUGUSTINE IS PONCE DE LEÓN'S FAME IMMORTAL

tone of upward of ten hundred thousand Americans marching to play and work. Big-league ball teams at practice in the sun; tired and retired capitalists on private yachts and patent-medicine barkers in flivvers; horseshoe pitchers and croquet players from small towns of the Middle West; crack swimmers and divers, golf professionals, brown sun-bathers, school children of all ages, hues, and creeds studying in the open air at desks set on the sand. Stunt flyers, prima donnas, and parachute jumpers; street fakers, and "the world's smallest horse"; wax-figure shows of Grant and Custer, Buffalo Bill, and Jesse James working the county fairs; dancing teachers and cruising taxi-men with "For Hire" cars brought all the way from Detroit and Cleveland; educators and evangelists, palmists and pugilists; puritans and impuritans; a great circus in winter quarters, its tapirs and giraffes capering in warm sunshine; barbers in green smocks and 399 beauty specialists in the city of Miami alone; taxidermists to mount one's prize tarpon or sailfish; market snake-hunters, with 12-foot tongs wading the Everglades.

Thousands cheering a winning horse thundering down a home stretch; barking greyhounds chasing a whizzing dummy rabbit; elsewhere, churches so packed that sermons are preached twice on Sunday mornings and fire chiefs detail men in uniform to keep the crowds from blocking the aisles; on Tampa's main street a giant scoreboard showing weekly figures of attendance at competing churches, thus proving that sun-hunters are also God-fearing. A million Americans, idle yet doing something, spending upward of $200,000,000 during a 120-day visitation. That is one phase of scintillating Florida.

Then, as suddenly as it began, the visitors' tumult and shouting die. The army departs. It goes pell-mell, swiftly, as noncombatants evacuate a city before advancing enemy troops. Sumptuous, high-priced hotels close and hordes of "snow-bird" waiters, bell hops, maids, and cooks backtrack to prepare the Northern resort hotels for another season.

The tourist wave takes months to reach the high-water stage, yet all want to go North in a week, thus straining even the

splendid facilities of the Atlantic Coast Line and other railways tapping the far south.

Divorced from the tension of winter racket, the real Florida relaxes and breathes easier now. She counts the profits earned from winter paying guests in return for bed, board, and otherwise; then turns to her big job—that is, how to work and prosper during the quiet months, when tourist trade is nil.

Photograph by Clifton Adams

THE "FOUNTAIN OF YOUTH" AT ST. AUGUSTINE IS REAL GOOD DRINKING WATER, ANYHOW

THE PROBLEM OF THE SOIL

Some towns and industries are, of course, long established and now stabilized. They would live well without tourists. Yet, to a singular degree, the huge seasonal income from tourists has upset the economic balance of the State. Tourist trade grew suddenly, and much faster than the State could increase its own balanced food production; thus Florida presents an odd picture. At times she throws away surplus fruit and vegetables. Later in the same year she may have to live out of tin cans. She has not yet learned to feed herself, but she is educating herself along these lines rapidly.

Excellent dairy herds are hers, yet she imports about two-thirds of all her butter and milk.

Here virgin America heard the evening low of wandering kine brought by Spanish explorers; here are vast grasslands, potential feed for infinite cattle; yet the State imports seven-eighths of all its meat.

Poultry farms grow flocks of 5,000 and 10,000 chickens, yet a large share of fowls and eggs consumed is bought from other States.

Despite the economic commotion of the past decade, Florida is still in sense a pioneer State. Her growth has been spotty, haphazard, marked by local spurts and lapses, seemingly a precocious child trying to run before she walks.

Riding south to Florida in the winter months along the Atlantic coast, you meet long trains of yellow-hued refrigerator cars rolling north, laden with fish, fruits, and vegetables. One single train hauled 104 cars of tomatoes. Seventy-five million hungry customers live within 36 to 48 hours of her gates, by express and fast

Photograph by Clifton Adams

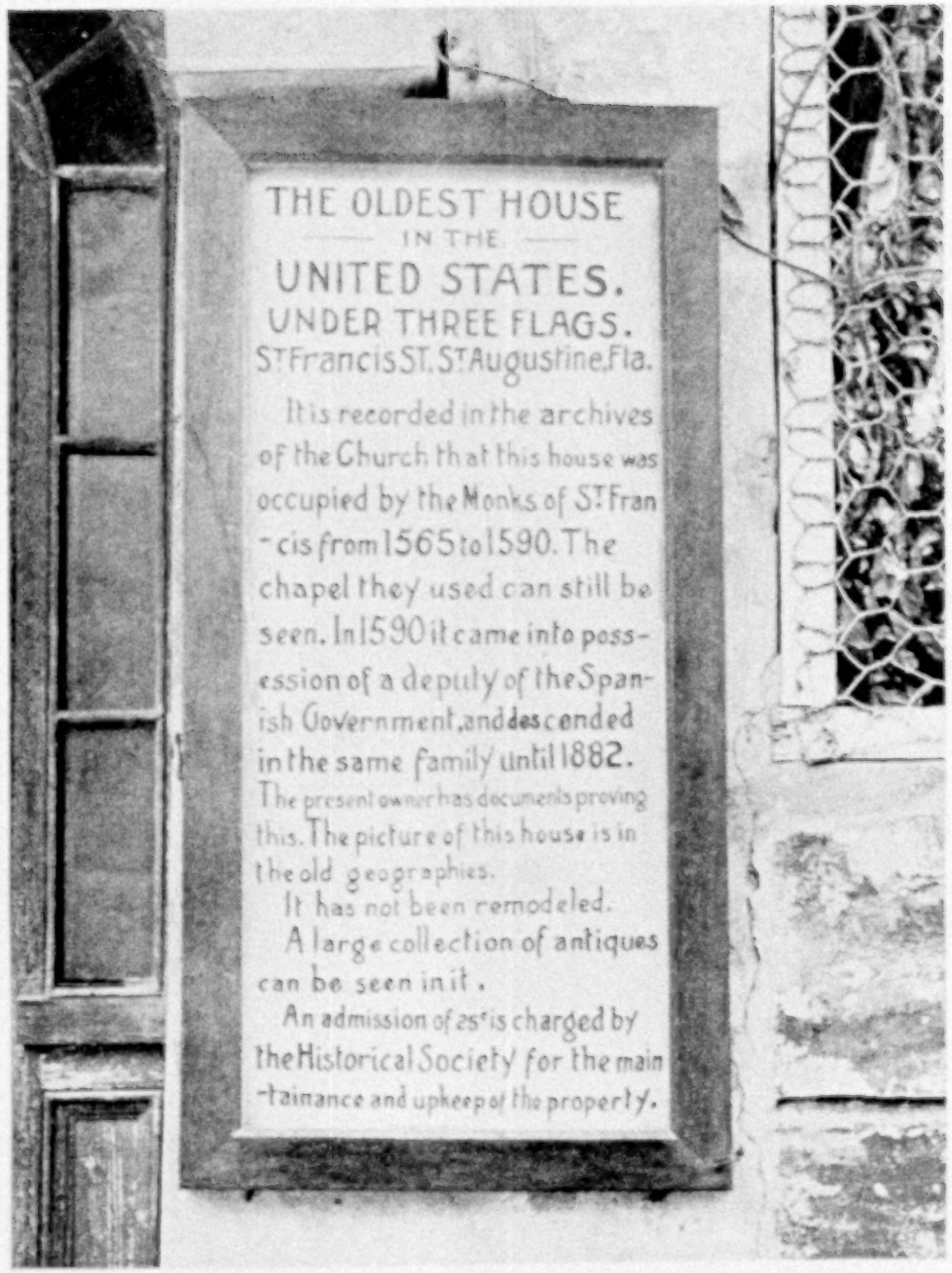
OVER THE ST. JOHNS RIVER BRIDGE AT JACKSONVILLE MOVES A VAST STREAM OF NORTH- AND SOUTH-BOUND MOTOR TOURISTS

Downstream, on the surface of the river, millions of floating wild hyacinths move every spring. Beautiful as these light-blue flowers are, the plant is really a pest, as it gathers in such masses about wharves and piers as frequently to impede navigation.

Photograph from R. F. Williamson

CHINESE OIL-PRODUCING TUNG NUTS GROWING NEAR GAINESVILLE

Tung oil is used in many trades. For decades America has imported it from China. Now, in Florida, groves of tung trees are introduced with the hope that eventually a part of our oil needs may be met here.


THE OLDEST HOUSE
IN THE
UNITED STATES.
UNDER THREE FLAGS.
St Francis St. St Augustine, Fla.
It is recorded in the archives of the Church that this house was occupied by the Monks of St Fran-cis from 1565 to 1590. The chapel they used can still be seen. In 1590 it came into possession of a deputy of the Spanish Government, and descended in the same family until 1882.
The present owner has documents proving this. The picture of this house is in the old geographies.
It has not been remodeled.
A large collection of antiques can be seen in it.
An admission of 25¢ is charged by the Historical Society for the maintainance and upkeep of the property.

Photograph by Walter A. Ru Keyser

WHEN SIR FRANCIS DRAKE RAIDED ST. AUGUSTINE IN 1586, ONLY THIS HOUSE ESCAPED DESTRUCTION

Known as the Old Spanish Mission Building, it is reputed to be the oldest European-made structure in the United States. It is now used as a museum by the Historical Society of St. Augustine.

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GRIMLY SUGGESTIVE OF LIFE AROUND RIVERS AND LAKES IN THE REPTILIAN AGE

At the alligator farm on Anastasia Island, near St. Augustine, more than 6,000 such reptiles may be seen. The larger ones were captured in the Everglades and other parts of Florida. Some are fourteen feet long and of great age.

freight. Two hundred kinds of crops, fruits, and nuts grow here, and shipments out of the State average *one carload every five minutes, the year around!* She digs new potatoes and picks beans, peas, tomatoes, celery, pears, papayas, grapefruit, and oranges when New York and Chicago are snow-bound.

Though she ships nearly 100,000 cars of orchard and garden crops a year, or more than 10 per cent of all that is sold in America, only a small part of her available land is tilled. You can ride for miles and miles, over superbly surfaced highways, through grass and pine lands as empty yet of human life as in the dawn of creation. And that is another phase of Florida. The few cents an acre which we allowed Spain when she ceded this land to us in 1821 is still a fair price for lots of it, as viewed through our glasses of to-day.

A curious cosmography; a variety of soil and growing conditions sprawls from lake-strewn ridgelands to Everglades and contributes to confusion of mind in reading the future.

THE INTAKE GATEWAY

North Florida, for example, is as different from south Florida as lower Alabama from Cuba. Colonists had settled

Photograph by Walter Lyman

A TURPENTINE GROVE IN NORTHERN FLORIDA

This "stand" of timber lies on both sides of the highway between Pensacola and Lake City. Many such plantations are found in northern Florida.

and developed an ante-bellum cotton and tobacco aristocracy at Tallahassee and thereabout when lower Florida was still a howling wilderness. Even to-day, we are told, one-fifth of all Florida's population was born in Georgia and Alabama; but that will not be true a decade hence.

Long ago, when bears fattened on crabs and turtle eggs where Miami Beach and Palm Beach now blossom, Spaniards built St. Augustine and Pensacola and connected them with a 400-mile military highway. You motor over much of this same old line now when you drive from Jacksonville west to Mobile and New Orleans. In the Cathedral at St. Augustine are to be seen crumbling, parchment-bound records of marriages and baptisms among Spaniards and Indians dating back to 1600.

Yet Florida—but for that settled strip along her upper edge—stood still for generations, while the rest of America was in the making.

The reason, of course, was the trend of migration to the great West!

Till recent years, when better communications came and America's food habits began to change through intensive distribution methods, refrigerator cars, and high-power advertising, there was no great consumer market for the golden winter

Photograph by Clifton Adams

ON FLORIDA BEACHES, AS AT ENGLISH RESORTS OR ATLANTIC CITY, THE SAND SCULPTOR EXHIBITS HIS EVANESCENT ART AND HOPES FOR A GENEROUS REWARD

fruits and green vegetables which the State to-day grows. Nor, till long after the Civil War, did manufactured fertilizer, on which Florida agriculture now depends, come into general use.

Also, years ago, there was yellow fever. In epidemic days it paralyzed Pensacola, New Orleans, and Havana. Then came Reed, Carrol, Gorgas, and other great men of medicine, and through science life was made safe for whites in mosquito lands. "When I came to Miami, after the Spanish-American War, it had 300 people," said a leading banker. "To-day we have 157,000 residents. Unless yellow fever and mosquitoes had been conquered, Florida could never have grown as she has."

To-day as utterly as the West has forgot the Indian dangers, so modern Florida has forgotten such past dangers, for practical sanitation and good drinking water prevail, and every intelligent Floridian teaches, preaches, and practices what science has given to mankind for the protection of health.

As science whipped mosquitoes, so bold builders conquered swamps and jungles, and humanized coral-born keys, tying to the Nation's railway net a new world of strange sights and smells. Down to Tampa the steel was thrust, annexing a quaint, Spanish-speaking city. And down this line in '98 roared boys in uniform, "average Americans," seeing Florida first on their way to help in a war of independence.

"Remember the *Maine*," cried girls at wayside stations, as troops rolled south to Tampa. Old men rang church bells; boys ran to enlist for the war in "Cuby," Uncle Sam's first armed racket overseas since 1815. On Tampa's sandy, fish-scented flats camped the tangle of raw recruits and balky mules. Dynamic Teddy Roosevelt was there, and methodical, able Leonard Wood; and the whole hybrid town sang and whistled America's new war song, the song that spread around the world—"There'll Be a Hot Time in the Old Town To-night."

THE DETERMINATION OF A GENIUS

Far down the then empty East Coast pushed yet another spearhead of twin steel, a "seagoing" railway. "Flagler's Folly," critics said of the one man with

Photograph by Clifton Adams

NOW A FOOD HABIT OF THE AMERICAN PEOPLE

Celery was for years a food of limited distribution until swift communications and intensive farming developed both the popular taste and the supply. Packing celery near Sanford, Florida, from whence came nearly 7,000 carloads in one season.

vision who built and paid for it. "A railroad and a string of railroad-owned, millionaire hotels way down in that empty wilderness! There's no freight to haul, no passengers, no customers for all those palatial hotels."

But Flagler looked across at Cuba; he looked up, saw the sun, and felt the trade wind's kiss. Then, in his mind's eye, he probably saw what critics with sensory eyes alone could not see—he saw the earth tracking in space, tilting first one end and then the other, making the play of seasons, but leaving Florida more sun than any other place in the eastern United States!

On down the coast he went with his horse and buggy. Back in New York, where many calamity howlers lived, it was below zero; yet all about warm sunshine bathed this Land of Flowers that lured Ponce de León centuries before. "The people will come," said Flagler. And they came. Hotels built decades ago—and flocks of newer hotels—at times turn real dollars away in droves, so great is the mass demand for bed and board; and thousands more rush on, down over his seagoing railway, to Havana. "Flagler's Folly" indeed!

Then freight came—an amazing traffic with Cuba—even as Flagler dreamed. Cuba is our second best customer in all Latin America, trade statisticians tell us. From Key West now giant ferries carry 30 loaded cars each, cars that float over to Havana, and then run all over the Cuban lines, distributing American-made motor cars, machines, tools, furniture, food, clothing—freight cars from all our home railways. Those cars come back loaded with sugar, tobacco, and other things to pay us for the American-made products we sell her. That is trade.

A NEW ERA OF TRANSPORTATION DOFFS ITS HAT

Sliding down the sunbeams, like giant roller coasters of the sky, come now the planes. Into greater Miami, with its many airports, flying fields, and seaplane docks, from Cuba, Haiti, Porto Rico, Nassau,

Photograph from Hamilton M. Wright.

THE FAMOUS HASTINGS POTATO CROP BELT OF ST. JOHNS COUNTY YIELDS FROM 45 TO 90 BARRELS PER ACRE AND ITS EARLY HARVEST REACHES MARKET AT THE MOST FAVORABLE SEASON

Florida's white potato crop, compared with that of nine other potato-raising States, is estimated, over a period of eight years, to be well in advance of all except Virginia's. In this section of Florida, potatoes planted in January may be harvested in April and May, allowing the industrious farmer to grow three crops in one season.

Photograph courtesy U. S. Department of Commerce

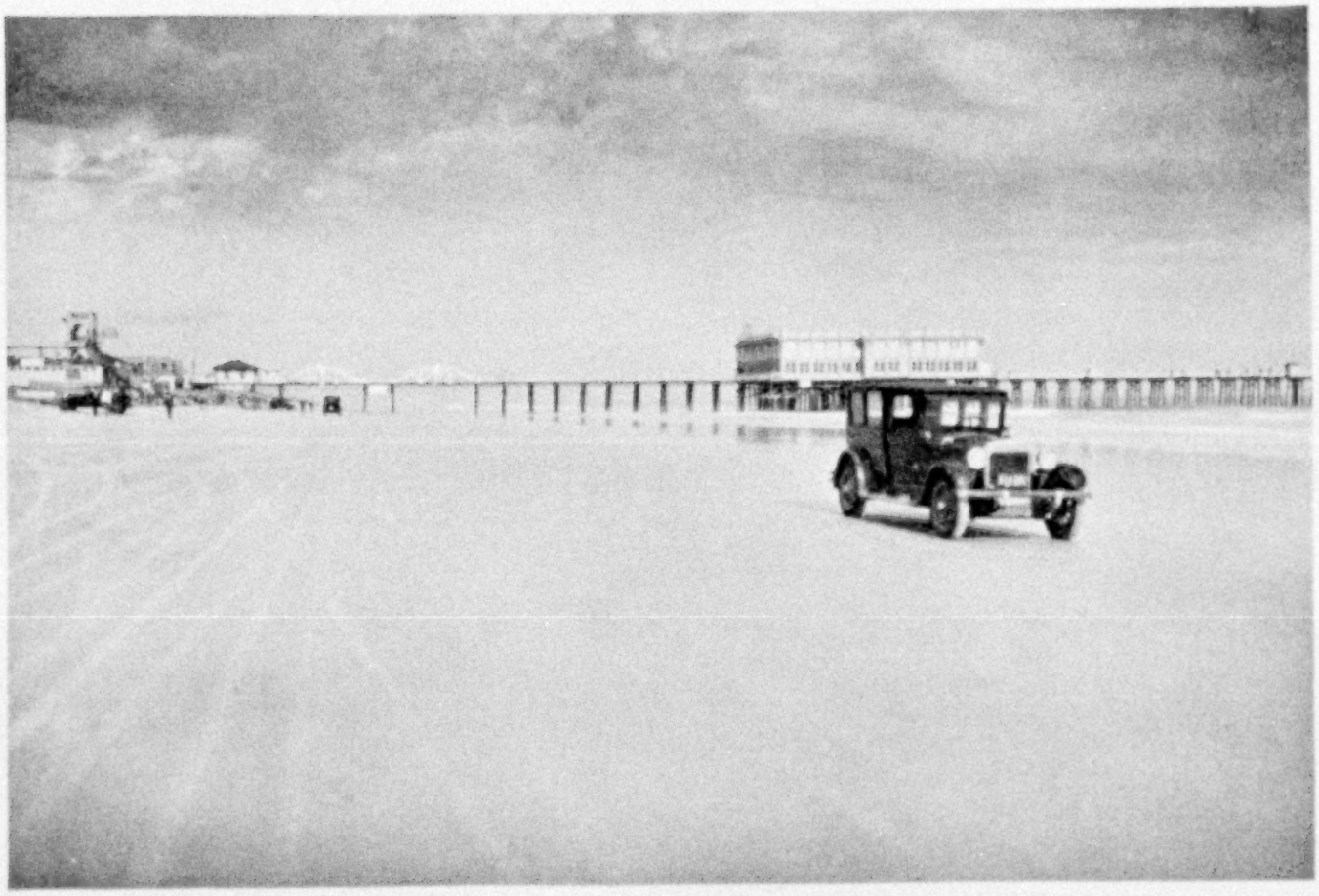
WHILE THE NORTH CRACKS JANUARY ICICLES OFF GARAGE DOORS, FLORIDA IS PICKING STRAWBERRIES

The red fruit reveals to Northern tourists motoring down to Tampa that they are indeed far from home. A berry patch in Hillsborough County.

Photograph courtesy U. S. Department of Commerce

HOW TO BATTLE GLOBE-TROTTING BUGS AND SAVE FOOD FOR MANKIND IS A NEVER-ENDING PROBLEM TO SCIENCE

Do we realize the grave menace to the world's fruit, vegetable, and grain crops which ever-spreading insect pests have become? To quarantine, to exterminate, to keep orchards, fields, and gardens free—that is science's big job. Spraying a grapefruit grove near Orlando, Florida.



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AT LOW TIDE THE WORLD'S FASTEST RACE TRACK APPEARS ON DAYTONA BEACH, FLORIDA

Dazzling white, of coquina and sand, this flat, tide-swept beach is so wide that 50 or more cars may drive abreast. Famous in the annals of speed tests, this beach has seen both motor racing triumphs and tragedies.

Photograph by Clifton Adams

THRIVING BENEATH A SLATTED SKY

Acres of Cuban wrapper tobacco, three weeks old in April, planted under a slat shade. The harvest will come in June. This plantation is near the town of Madison.

A SKY VIEW OF THE SPEEDWAY BEACH BETWEEN DAYTONA AND ORMOND, FLORIDA

Panama, and South America come and go the big 3-motored cabin ships. Customs men are at the airports to inspect bags and ask for duties, while immigration officials examine passports. Ticket office, baggage rooms, restaurant, loading platforms, with tiny but stout "gas mules" that haul big planes to their sheds, and growing crowds traveling now by air and landing as carelessly as back-from-Europe tourists pour down the gangplanks at New York or Boston. Miami—indeed, most of the Florida cities have become air-minded, for flying conditions are just about ideal. And climate is again the answer.

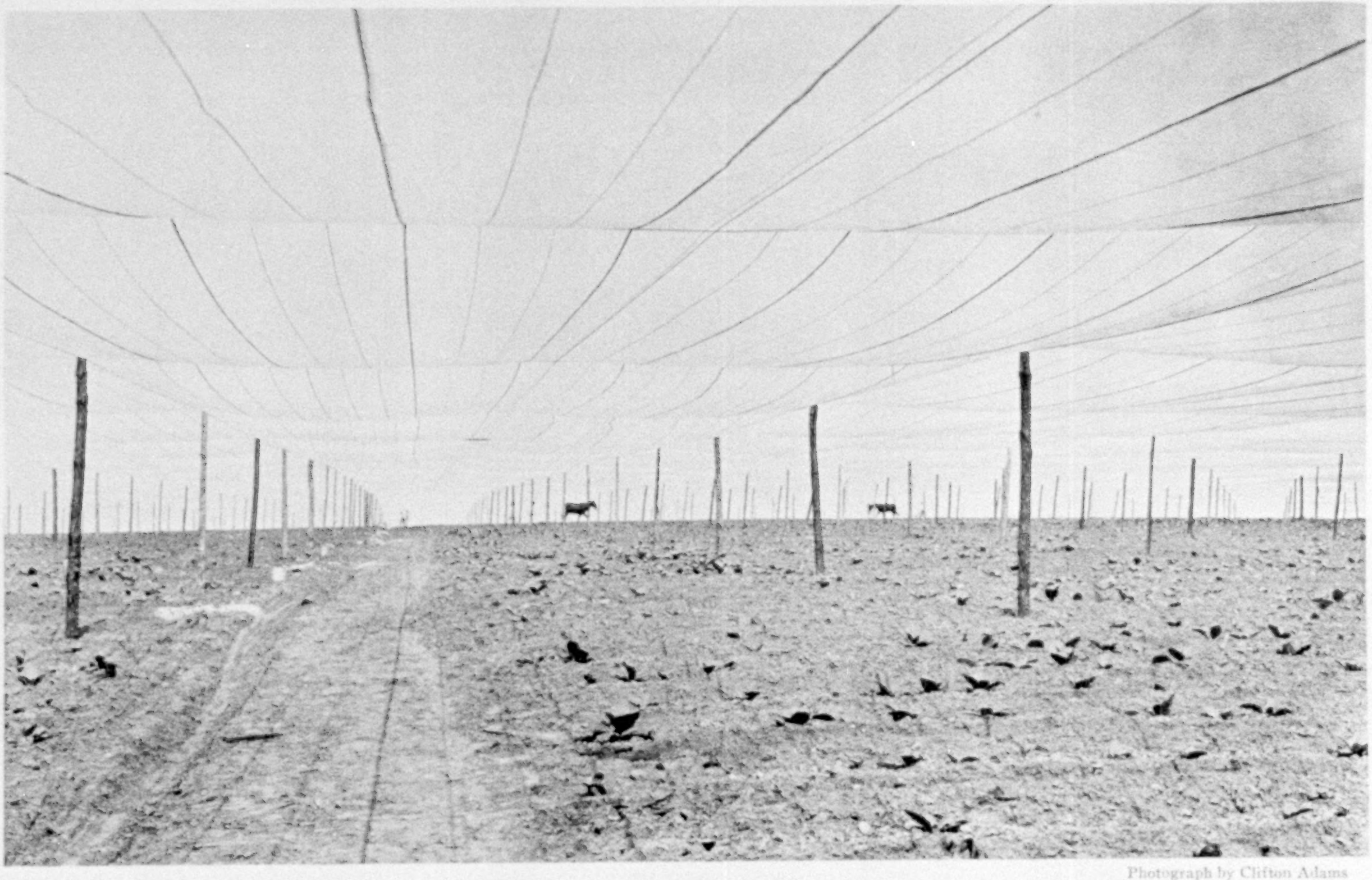
Restless, absorbing America! Land of magic economic change that fathered Florida! You sense its fine aggressive spirit when, riding in from sea, you watch Miami and Miami Beach silhouette their towering architectural masses against a sunset sky. Amazing they are, in their effect of stark simplicity and power, lifted by puny men from the sand spits and mangrove swamps of yesterday.

Always the contrast persists. Ten miles west, the Everglades; a crane gulping down a wriggling snake, a 'gator pulling under a wild duck; a homing Seminole, silent, watchful, in his dugout; abysmal waste, solitude, fascinating to the naturalist.

CLIMATE STIMULATES CULTURE IN FLORIDA

Yet, if you think in time and not space alone, you can vision what Florida's population must some day be. It is the way of subtropic lands, where living is easy, as in the West Indies.

Life here has a different tempo, a sort



Photograph by Clifton Adams

LIKE A HUGE CIRCUS TENT, THESE CHEESECLOTH SHADES FREQUENTLY COVER FLORIDA TOBACCO FIELDS

In northern Florida, as in Cuba and Porto Rico, these white shades, seen from an airplane, appear to be big squares of snow-covered ground. By thus tempering the hot summer sun, a better wrapper leaf is grown.

Photograph by Clifton Adams

MANY DISTRICTS IN THE EVERGLADES AFFORD GOOD GRAZING

On this 40,000-acre ranch near Brighton native cattle have been cross-bred with the humpback, or Brahman, bull of India. This produces a stocky, meat-bearing animal practically immune to tick fever.

Photograph by W. A. Fishbaugh

PICKING WINTER TOMATOES IN THE FLAT, FAR-FLUNG GREEN FIELDS OF FLORIDA

Through January and into April, Florida meets but little competition from any other tomato-growing State. During this period, however, thousands of carloads are imported from the Mexican west coast and some from the West Indies.

Photograph by Clifton Adams

AN UNDERWATER FAIRYLAND IS SEEN AT SILVER SPRINGS

So clear is the water that submarine flora, growing amid fantastic formations of rock and shell, with fish darting about, is plainly visible even where the spring is 80 feet deep. This girl swimmer, feeding the tame fish, is many feet beneath the surface. In the background is the dim hulk of a sunken boat.

of tropic rhythm. Sun, sand, the blue, sparkling waters of the Gulf Stream, blossoms of every hue, and waving palms bring a sense of luxury even to the masses. They are among the State's intangible assets and quicken man's interest in cosmic things. You see this revealed in a State-wide solicitude for flowers, ornamental shrubs and trees, a deeper sense of all that is beautiful in Nature. They bring other episodes and symptoms. Bird sanctuaries abound. Men who used to shoot wild ducks to-day go out mornings to feed them. Many sailfish and tarpon caught for sheer sport are released by sportsmen, for their food value is negligible. Filming movie scenes of game fish being caught is a new form of piscatorial adventure, and as the camera is said not to be intentionally disingenuous, the proof of skill can so be later shown by film or print to the doubters at home.

Men seek the sun here as moths a lamp.

Habits, methods of work, architecture—all are influenced here by steady sunshine. On Jacksonville's humming docks you see checking clerks busy in shirt sleeves in January. At Miami Beach is a large, wonderfully complete public schoolhouse almost without walls, so that its hundreds of youngsters can store up health and education at the same time. At St. Petersburg one sees the younger school children, attired in breeks, absorbing their three R's at desks which stand under the trees.

West of Tallahassee one rides past many tobacco fields where plants are grown under "shades." These shades are made by stretching thin cotton cloth over frames of poles and wire, for farmers have found they may best grow certain vegetables under the same properly tempered conditions in all seasons. Tobacco seed, for planting in Virginia and elsewhere, is often grown in Florida, since better seed develops where plants enjoy the longest periods of daily sunshine.

Florida long since awakened to the urge of golf and offers scores and scores of good courses upon which tens of thousands play when northern playing would require snowshoes. Strings of big-league baseball teams train hereabout every spring. This fact challenges the old idea that whites are lazy in warm countries. In the pine woods, in the vast tomato and bean fields, men work as hard and as long as anywhere. In north Florida, field workers use the phrase "from kin see till can't see"—from dawn till dark. At Winterhaven I saw a fruit-picking contest. In 3 minutes and 47 seconds a girl wrapped, twisted, and packed a box of 176 oranges to win the offered prize.

Like the migratory workers who go from Poland each year to harvest sugar beets in Germany, or the hordes who follow the wheat harvest across our West, Florida has its incoming army of seasonal workers. "Snow-birds" they are called here, because they migrate to miss the snows. Thousands come each winter to work in hotels, stores, garages, and in the handling of the immense fruit crops.

MANKIND DIFFERS AS TO WHAT CONSTITUTES ENJOYMENT

Of course, sharp clashes of ideas, to make conversation an adventure, are rare among tourist groups here. They have too much in common. In fact, there's a mass attitude, or attitudinizing, and a standard terminology adequate for all popular tourist themes, such as fishing, golf, tennis, pitching horseshoes, the folly of booms, or the "bad weather back home." A blizzard in Pennsylvania, or any northern section from which tourists largely come, is always a front-page story in Florida papers, and with what glee the sun-birds commiserate with their stay-at-home brethren!

One intellectual oasis, however, is the "open forum" at St. Petersburg. In a park there, after the band concerts, crowds of many hundreds remain for organized debate and good-natured harangue. Argument is rife on any theme from egg-laying contests to whether the influence of Ibsen is permanent or evanescent.

"At the open sessions we let 'em argue about everything but religion," a city official said. "We had to bar that, although bigger crowds go to church here than anywhere else in Florida. Often the preachers have to deliver the same sermon twice on a Sunday morning, and the second congregation is as large as the first."

"I can confirm that," the fire chief remarked. "We've never had to turn the hose on 'em, but often I've sent men in uniform to keep a big congregation from

Official photograph U. S. Navy

PENSACOLA FROM THE AIR IS A FAMILIAR SIGHT TO HUNDREDS OF NAVY FLYERS WHO HAVE TRAINED HERE

Echoing long ago to the cannon roar of defending forts, battling under many flags, pine-scented Pensacola's past is written large in American history. But to-day, trade rivals tradition. The ancient town, seething once with colonial intrigues, concentrates now on fish, tourists, and turpentine and is, as well, a real social center.

Photograph by Richard B. Hoit

FROM PALATKA TO PENSACOLA, FLORIDA HUMS WITH THE SONG OF THE SAWMILL

The wide St. Johns River is tidal to Palatka, so that ocean-going vessels reach this busy lumber port via Jacksonville. From here steamers also ply to Crescent Lake. Cypress lumber piles at Palatka.

Photograph by Clifton Adams

ONE-THIRD OF ALL AMERICA'S ORANGES GROW IN FLORIDA

Introduced in Spanish times, oranges early became a valuable Florida product, pioneer growers hauling fruit down to trading schooners in ox-carts. Now they are scientifically cared for, grown by the square mile, and shipped by the trainload.

blocking the aisles and jamming the entrance ways."

Socially speaking, in Florida the whole is not equal to the sum of the parts. You cannot add St. Petersburg, for example, to Palm Beach or Miami, because you cannot add unlike things.

PAY YOUR MONEY AND CHOOSE

Life among the idle well-to-do at East Coast resorts, as pictured in Sunday rotogravures, is a familiar theme. Sunburned beauties sprawling under beach umbrellas; self-anointed social queens in raiment that would discount Joseph's coat of many colors, being trundled along under the palms in an "afromobile"; fleets of private yachts and comfortable houseboats at anchor; gay race crowds or dancing groups under moonlit palms—all these are well-advertised aspects of Florida winter-visitor life among those who, with many servants and mountains of baggage, move leisurely north each year, following the march of spring from resort to resort, up and down the Atlantic coast. Just the same, one finds at the principal resort centers like Miami and Palm Beach the finest sort of concerts and lecture series made up of world-famous artists and cultural speakers, and there is an overflowing attendance.

But in all America there is probably no group just like the 150,000 or 200,000 fine type of farmers and small-town folk who visit St. Petersburg. It is an amazing sociological phenomenon, peculiar to this unusual State. It is worth contemplating.

Here flourish 31 different clubs and societies, formed among tourists from various cities and States. There are even clubs of Canadians and Scandinavians, half a world away from their homes. There are dance, dramatic, and sunshine card clubs; clubs of roque, croquet, and shuffleboard players and a Three-Quarter Century Club, all of whose members are more than 75 years of age. And there is a municipal solarium, with its Sun Bathers Club—in all, more than 1,000 people—who lie about in little less than

Photograph from The Out-of-Door School

A PRACTICAL GEOGRAPHY LESSON AT AN OUT-OF-DOOR SCHOOL IN SARASOTA, FLORIDA

Children bring from home clippings of current events, taken from newspapers and magazines. Each child reports to the class on "his event." The clipping is then tacked on the map-board and a string run from it to the map-spot where it occurred. Humanized geography easily becomes a fascinating study to children.

nothing every day, exposed to the sun's rays, to store up health at a minimum cost—and they are serious-minded folk, not publicity-seekers.

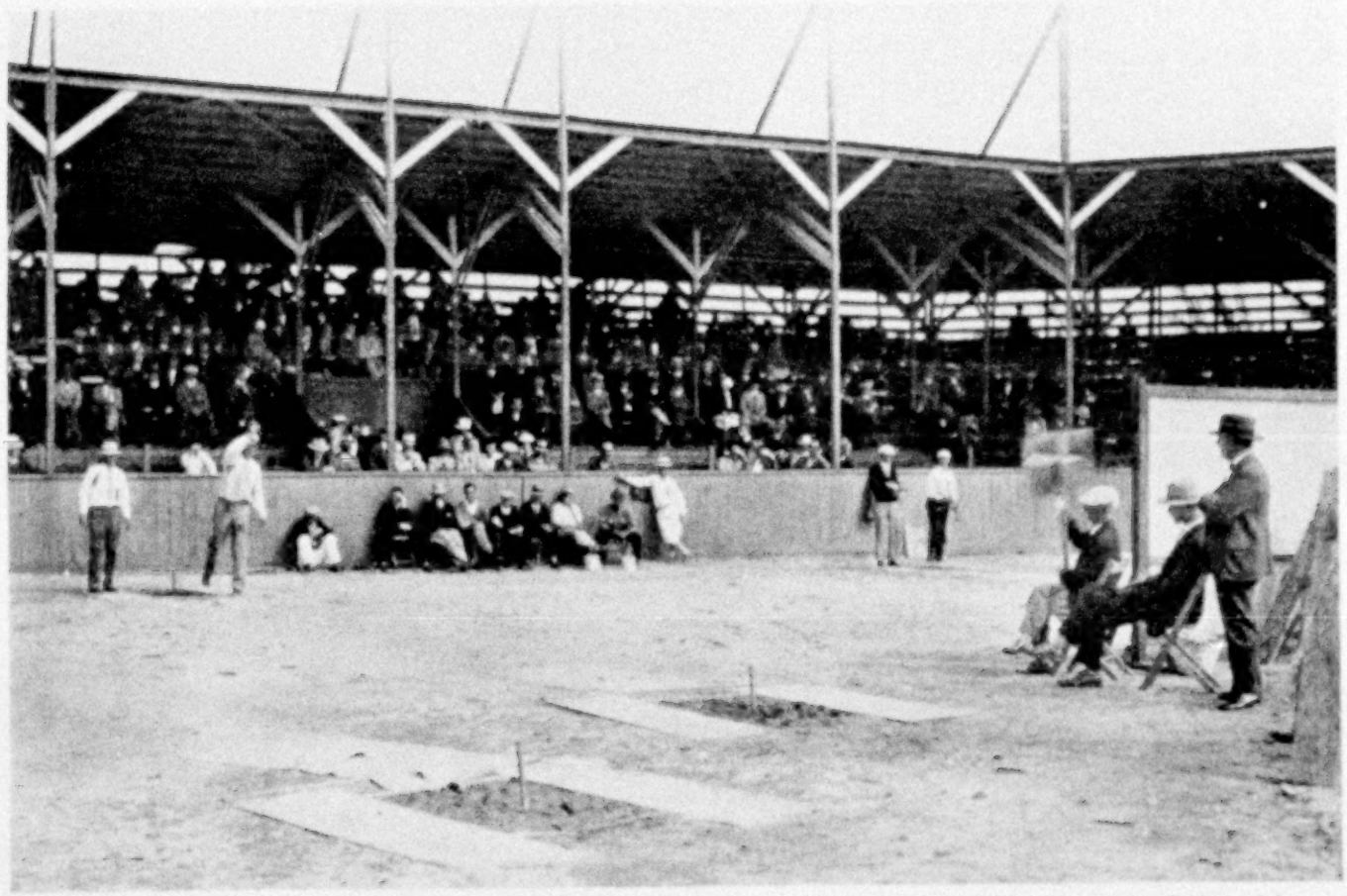
Then there is the Green Bench Club. In orderly rows, along the main street, are 5,000 green benches, where 20,000 people sit and sun themselves. It is an institution unparalleled anywhere on earth. The nearest thing to it, perhaps, is the public bench in the Baghdad bazaars, where wool, rug, date, and camel merchants collect in the cool of the evening to smoke gurgling water pipes and gossip about prices and Arab wars.

Huge throngs crowd the parks each season, when the world's champion horseshoe pitching contest is held here; so wide is public interest in this sport that stories about it are handled over the wires by news agencies.

"The Sunshine City," St. Petersburg calls itself. Last year it held a "sun celebration" to observe the passage of 367 consecutive days upon each of which the sun shone.

To show its faith in steady sunshine, the city built the first open-air post office in America; not an "open-barrel" post office, as in the days of the virile, hairy West, but a fine building, with lock boxes opening on the streets and writing tables sheltered by only a roof.

Curiously enough, most of the visitors here appear to be of middle age or past. To accommodate them, ramps instead of steps are built at street intersections and at the entrance to many public buildings. No other city gives more thought to the comfort of its visitors or lives more completely on what they spend. The city even provides paid choirmasters to lead community singing clubs. On Sunday afternoon one sees at least 3,000 people, gathered at the end of a giant municipal pier, singing "Old Black Joe," "Nellie Gray," and other folksongs of long ago. It was plainly an emotional experience to



Photograph by Clifton Adams

FOR THE WORLD'S HORSESHOE CHAMPIONSHIP

No participants in Olympic struggles for athletic laurels take their game more seriously than do these skilled hurlers of the lowly horseshoe, who arrive in crowds from the great Midwest each season, to try their skill against all comers, at St. Petersburg.

this vast throng of fine, honest, thrifty, Americans—another phase of national life. It could probably happen in no other country except ours.

FAR FROM VISITING CROWDS

In more remote sections of northwest Florida, distant from tourist trails, rural life is still simple and easy, as in that antebellum South whose spirit it still reflects. Most of its population came here in "mover wagons" long ago, from Georgia and Alabama. On the lower Suwannee one Sunday afternoon I chatted with some old men who sat on the river bank.

"Why aren't you fishing?" I asked.

"We've got nothin' else to do all week but fish," said one. "Sundays we just rest."

In contrast, one night, at Miami Beach, I watched the fleet yapping greyhounds, tended by boys in bright caps, riding coats, and patent-leather boots, racing foolishly after an artificial "trolley" rabbit running on a monorail. A few evenings later, on the shores of Lake Okeechobee, the canine comedy had changed. Now a howling pack of country hounds, whose husky keeper would have snorted at colored coat and fancy boots—honest hounds, with ears and noses cut and scarred from many a combat—were engaged in the matter of hunting wild cats in the islands of palmetto scrub.

SOME PHYSICAL ASPECTS OF FLORIDA

Peninsular Florida is a freak, geologically.

One day, on a fruit farm near Homestead, I heard a loud explosion. "Don't be alarmed," said my host. "That's only somebody setting out a rosebush."

The answer is that much of middle and south Florida is simply a limestone plain covered with shallow sand. To plant trees or make any excavation, blasting is necessary. At other times a big scarifier, drawn by a tractor, is run over the solid rock field, tearing it up as if it were a paved street.

Sinks, or "potholes," which vary in size from a few square feet to thousands of

Photograph by Clifton Adams

SOME SIT AND THINK AND SOME JUST SIT

As birds year by year return to familiar old nesting places, so these perennial winter visitors to St. Petersburg flock back to the green benches on Central Avenue, each to his favorite seat, to exchange views on life with his neighbor.

acres, are an odd aspect of this formation. They occur when the crust breaks. These sinks account for the State's 30,000 lakes, its many subterranean streams, and incredibly copious springs.

From this network of underground rivers comes the astonishing Silver Springs near Ocala. Here is one of Nature's happy moments. Through glass-bottom boats one looks down into a fairyland of fishes, idling among a veritable garden of submarine plants which suggest a jungle seen from an airplane. As the water flows through porous limestone, every atomic particle of coloring matter is strained out, leaving it crystal clear. Open-eyed swimming in this pool is like looking on the sea bottom through the glass of a diving helmet, for the water is almost as transparent as air and the vast spring is like a great open-air aquarium.

Florida's tidal shore line is longer than that of any other State. Key West is so far from Tallahassee, the capital, that in the legislature its far-away member is jokingly referred to as "the Ambassador from Key West." Nearly seven per cent of her area is covered by lakes and rivers—rivers that flow in every direction. The St. Johns runs due north, up State, and shallow Lake Okeechobee covers 700 square miles. The vast Everglades and Big Cypress Swamp to the south are among the natural phenomena of the world.

Since the days of the first white visitors to the Everglades, endless descriptions in many languages have been written of this extraordinary region. To-day, with its partial drainage, upon which millions are being expended, and progressive cultivation plans in work, it is more than ever of public interest. Some day its engineering problems of overflow drainage will be solved, but the day is yet well in the future unless the Federal Government takes charge, as in the Mississippi Valley. No detailed discussion of the Everglades problem, with all its ramifications, can find place in this bird's-eye survey of the great Commonwealth; "for that," as Kipling said, "is another story."

Briefly, however, this extraordinary re-

gion is not and never was the dark, equatorial swamp, with boa constrictors dangling from trees to grab at passing animals, so graphically shown in woodcuts which illuminated early geographies.

Yet, with its vast, trackless water wilderness, its almost impenetrable saw grass tangles, its hummocks and wild life, it truly ranks as one of America's natural wonders.

Running from the southernmost tip of Florida north for 170 miles, to Lake Okeechobee, and measuring about 70 miles east and west, extends a rock-bottomed, shallow basin. Its rim is a few feet above mean low tide in Biscayne Bay. This watery area forms the famous Everglades. It is really a lake and not a mammoth stagnant swamp, as is often supposed; yet no surface water flows into it. Heavy rainfall and subterranean streams keep it clear, fresh, and in motion, for it has many outlets. Besides drainage canals dug in recent times, it is drained into the Gulf of Mexico by the Shark River, the Harney, and others, and from its eastern shore by the Miami, the New, and the Little rivers. An odd aspect of the water is its constant movement, in currents and cross-currents, seemingly caused by downward escape here and there through holes in its rocky bottom to subterranean outlets.

Sharp-edged saw grass, tough as bamboo, is the enemy of all who seek to wade through it. Growing under water, it is pale green, but it turns to a dull yellow as it emerges into sunlight. Winding lanes open through it here and there, but old settlers around the Everglades say only the Seminoles can really "get where they're going" through these crooked liquid avenues.

A NATURALIST'S DELIGHT

Islands abound. Some are outcrops of the rock basin, overlaid with rich mold, forming sizable cultivable areas. Virgin forests cover many of the islands, with bay, live oak, prickly-ash, papayas, custard-apple, wild rubber, and other trees in profusion. The "strangler fig" vine (the Florida strangler), the morning-glory, and honeysuckle attain great size. There is the coontie plant, too, from which the Seminole extracts flour and starch, and often the pine, and the cabbage palmetto.

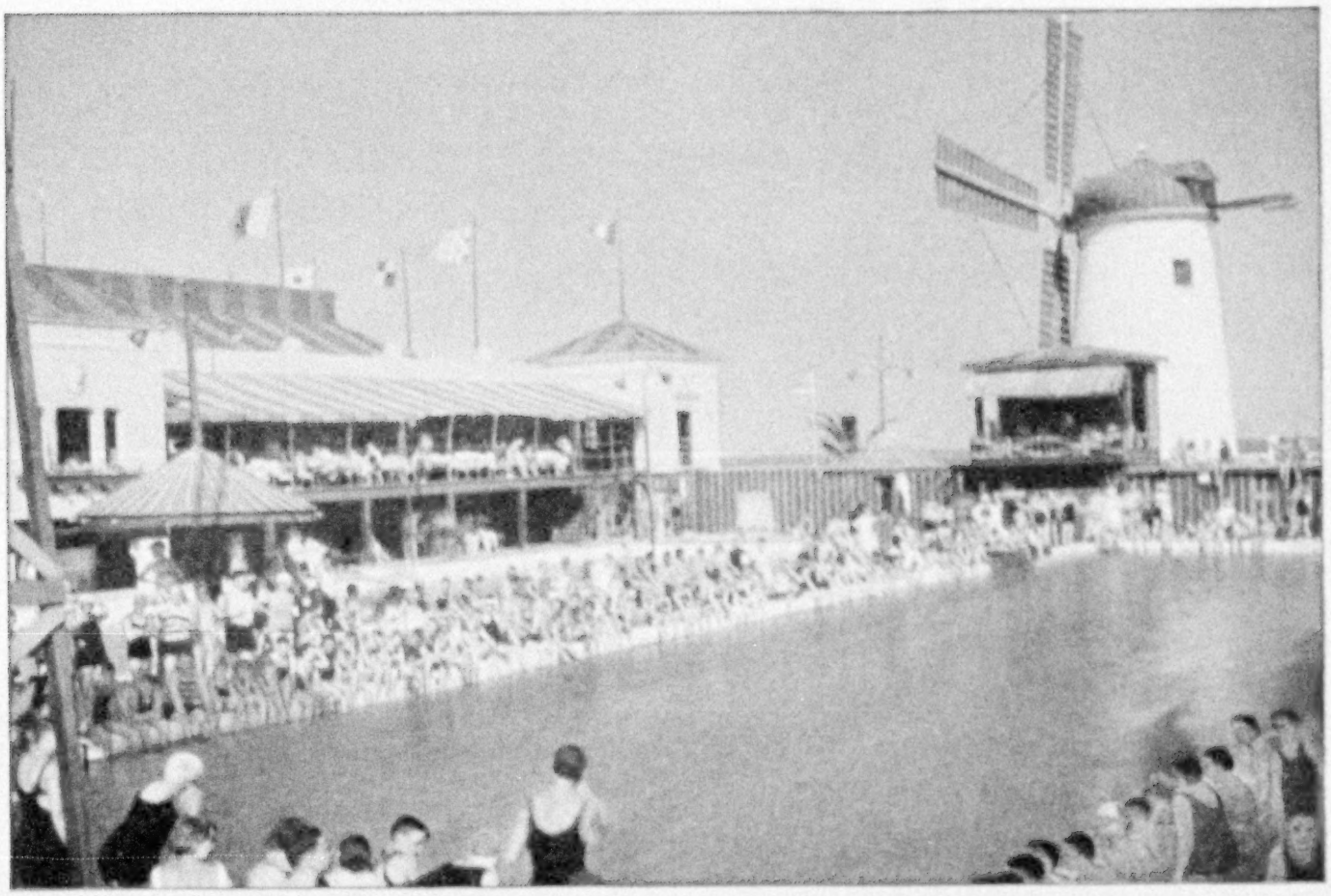
Giant ferns, with fronds 10 feet long, gorgeous orchids, many kinds of air plants and waterlilies, are among the wide variety of wild flowers. A unique flora, indeed, with no doubt many plants as yet unclassified.

Though vandal plume-hunters in years gone by ravaged the bird life, egrets and the roseate spoonbill still breed here. To-day the naturalist who scans the ground and sky sees the migratory duck, an occasional heron, the bittern, coot, cormorant, Everglades kite, crane and other waders; or, following a big storm at sea, tens of thousands of seabirds resting and quarreling, anxious to be gone upon their lawful occasions!

Bear, deer, panther, and otter were once abundant. Though these are passing, Seminoles still have a regular hunting season, bringing to market well over $500,000 worth of raccoon, alligator, snake, wild cat, and other skins in a season. But the ancient happy hunting ground is shrinking before the machinery of road-makers and ditch-diggers. Of snakes, a skin-hunter told me, there is no lack. "I can put one ad in a Miami paper," he said, "and get all the snake skins I want for 7 or 8 cents a running foot."

But it isn't alone the Everglades scenery nor wild life that intrigues the Florida farmer of to-day. What he wants, and must have to serve the Nation, is more dikes and ditches, more reclaimed "muck" land for growing sugar cane, tomatoes, and marketable vegetables that will change themselves into dollars upon arrival in northern markets.

This "muck" is a physiographic marvel. It is a loose, black soil of decomposed plant life that is exposed after drainage. In spots it is so soft that mules sometimes wear a snowshoelike gear to keep from bogging down. Sometimes tractors used in muck must be equipped with extra-broad treads. When one of these machines "slipped" its treads, it sank out of sight and was recovered only by a drag line anchored to near-by trees. If allowed to get too dry, muck burns like peat—burns for weeks, smoldering many feet deep. If too wet, crops drown. The problem is to dike a field, and then, with big pumps, hold the water table just where it is wanted by pumping in or out—a simple engineering problem.



TOGETHER WITH UNEXCELLED SURF BATHING, MIAMI BEACH OFFERS NUMEROUS OPEN-AIR SWIMMING POOLS WHERE MANY AQUATIC CHAMPIONSHIP EVENTS ARE HELD

© National Geographic Society Autochromes by Clifton Adams

BEACH PARASOLS BLEND INTO A MOSAIC OF VIVID HUES

Members of the attractive clubs along the ocean front at Miami Beach bathe in the blue, sunlit Gulf Stream and enjoy other healthful exercise when the northern resorts are icebound.

ANY TIME IS BLOSSOM TIME IN FLORIDA

An ever increasing variety of flora flourishes luxuriantly in the soil and climate of our most southerly State. From far tropical corners of the world many exotic species have been transplanted further to beautify the landscape.

© National Geographic Society Autochromes by Clifton Adams

WILD HYACINTHS BLOOM IN PROFUSION

Although lending added beauty to the landscape, these flowers are not altogether an asset. Their roots form a mat near the surface of fresh water lakes and sluggish rivers, thus becoming a real hindrance to navigation.

THEIR EXILED FORBEARS RULED THE MYSTERIOUS EVERGLADES

The Seminoles, now numbering but a few hundred, are a sturdy and self-supporting people who cling to their tribal ways. They still mete out justice in their own way to offenders against the tribal law.

© National Geographic Society Autochromes by Charles Edward Hagle

COCONUT PALMS FORM CATHEDRAL ARCHES ON THE WHITE SANDS OF LONG KEY

This tiny isle between Key West and Miami is an angler's heaven. Here fishermen from all parts of the world pit their skill against the marlin, sailfish, tarpon, bonefish, and many other gamy varieties.

© National Geographic Society

Autochrome by Clifton Adams

MIAMI BEACH SMILES ACROSS BISCAYNE BAY TOWARD MIAMI ON THE MAINLAND

Three great boulevard causeways connect the city on the mainland with the municipality beside the sea. Miami Beach is a miracle of beauty and engineering skill as well as an enduring monument to the vision and determination of those who conceived it and converted a mere mangrove marsh into a winter paradise. The white shaft of the Flagler Memorial, erected by Carl G. Fisher, rises in simple majesty from the waters between man-made islands.

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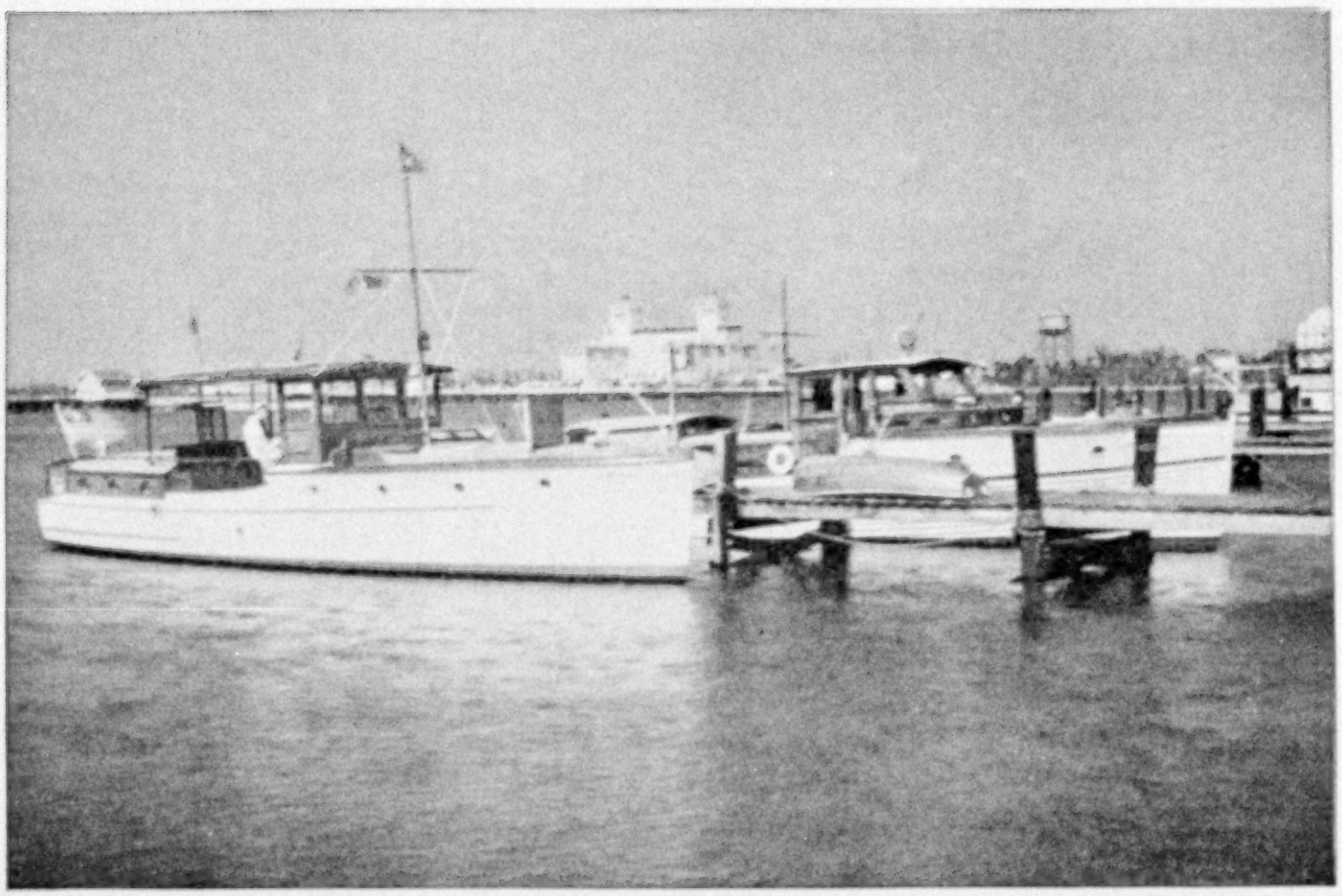
Autochrome by Charles Edward Hagle

TOWERS OF A MAGIC CITY LOOM

Approaching the harbor from a distance, Miami's skyline looks astonishingly like lower New York. Each year tourist trails converge toward Miami, and over them pours a vast army of pleasure-bent and health-seeking folk. Many become so enamored of its charms that they remain indefinitely. Miami Beach, beside the Gulf Stream, is seen across the bay.



PLACID LAKE WORTH

The beautiful stretch of water separating Palm Beach and its island from the mainland is a rendezvous for scores of comfortable house boats and ocean-going yachts each winter.

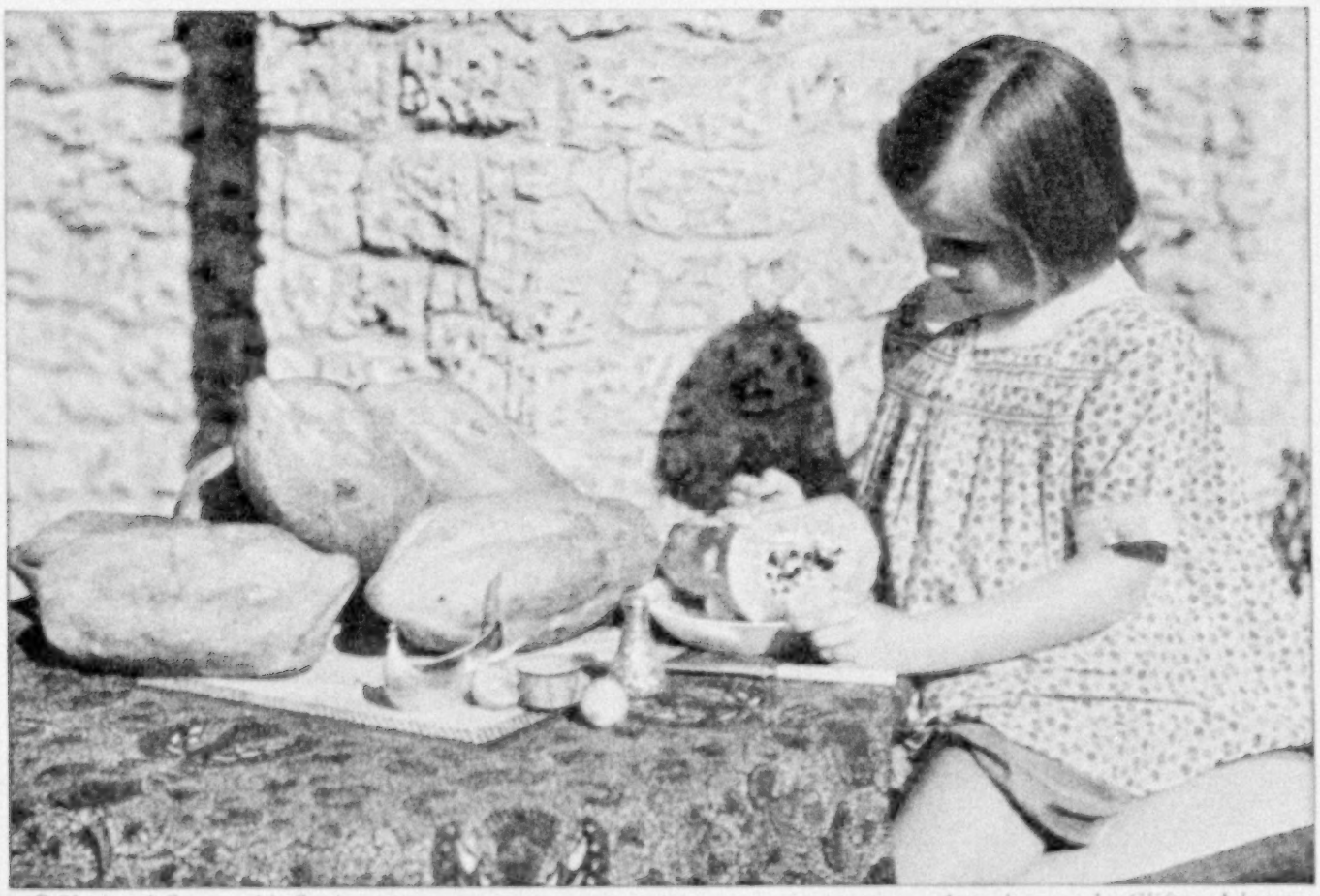
© National Geographic Society Autochromes by Clifton Adams

MIAMI UNIVERSITY STUDENTS GAIN KNOWLEDGE AT FIRST HAND

Advanced classes in biology studying marine life. Equipped with diving helmets, the students walk about the ocean floor of Biscayne Bay 12 feet below the surface and gather specimens.

DOMES AND MINARETS SUGGEST THE LURE OF THE ORIENT

Many different styles of architecture are found in Florida communities. This Arabian Nights motif is at Opa Locka, north of Miami.



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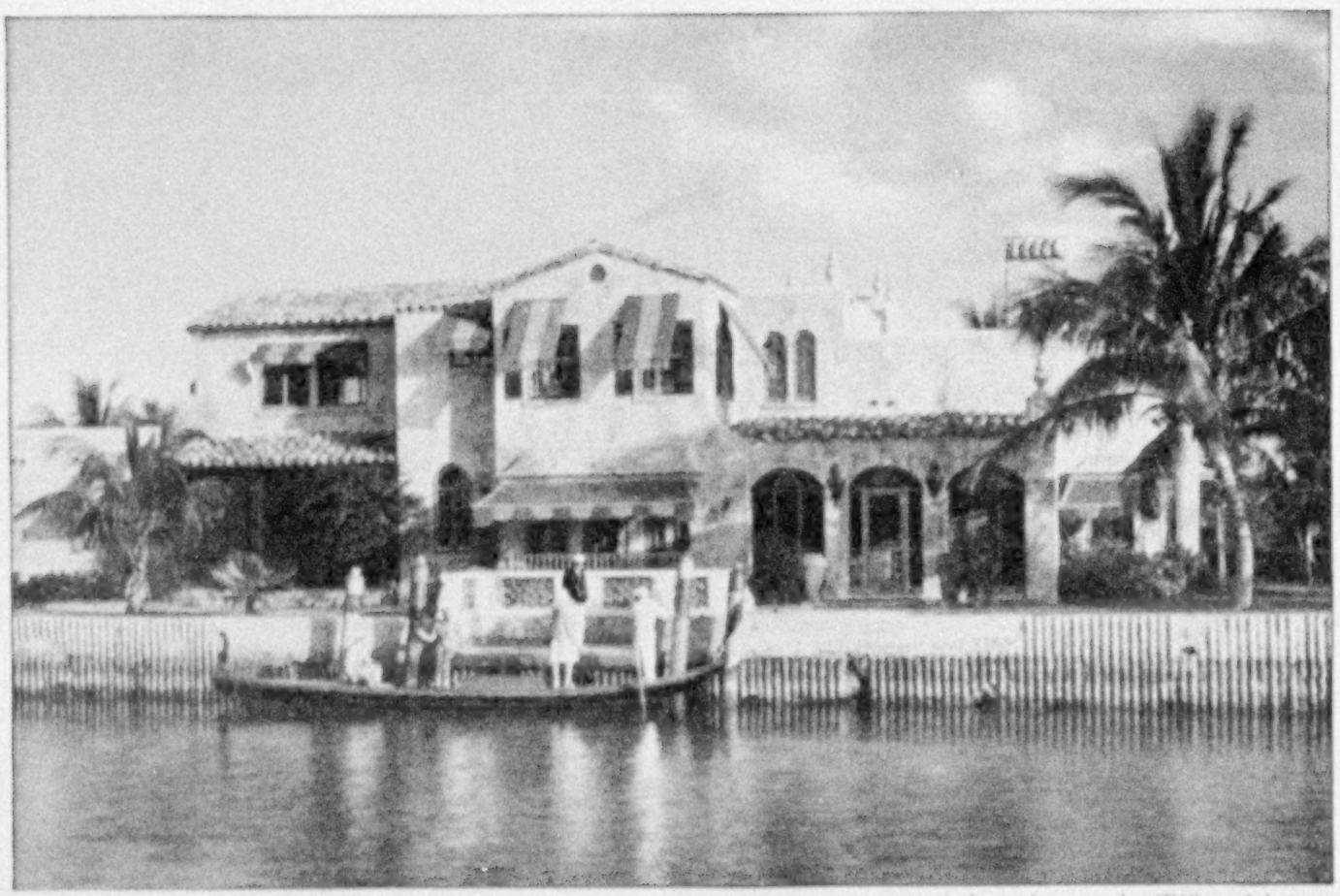
PAPAYAS RAPIDLY ATTAIN FAVOR

Served with salt or lime juice, the meat of these tree melons is delicious. Florida's fruit-producing area is one of the richest in the world.

SUN WORSHIPERS DOT THE MILES OF GOLDEN STRAND AT MIAMI BEACH



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IN A LAND WHERE WINTER NEVER COMES

Florida has proved so attractive to lovers of outdoors from the cold North and Midwest that thousands have established permanent homes there, to be ever in hearing of the song of the Gulf Stream. Indian Creek, Miami Beach.

As in "Jack and the Bean Stalk," plants fairly leap to almost supernatural size when ideal water conditions are achieved. At Canal Point one sees cane growing to amazing heights and potatoes ready for market when only a few weeks old. Around Clewiston, south of Lake Okeechobee, extensive areas of muck are being reclaimed by a cane-sugar ranch. If frost threatens, water is quickly pumped in to raise the temperature. It is a strangely artificial agriculture—temperamental and full of surprises. "Taming these Everglades is like breaking an outlaw horse," said a farm emigrant from Montana. "Just when you think you've got 'em broke, they show you a new trick."

A NATIONAL PARK PROJECT FOR FLORIDA

On the southern tip of Florida, in that most nearly tropical of all areas in the United States, a new national park is planned. This romantic region includes part of the Everglades and is the retreat of many nearly extinct beautiful birds and a widely varied animal life found nowhere else in America. Such creatures as the giant ibis, the Everglades kite, the white heron, the alligator, crocodile, and manatee are all found here; yet, under present unprotected conditions, they are being slowly exterminated. Were this area set aside as a national park, the wild life could be protected as in all great Federal and State parks.

Likewise in this amazing region there now exists a plant life of wild and superbly beautiful palms, orchids, bromeliads, and fascinating climbing lianas. But, like the bird and animal life, these colorful glades and hummocks are threatened with destruction from fires, often left by careless hunters and others, unless the protecting hand of the Government is raised in time to save them.

Set apart, preserved, and made accessible as the Everglades National Park, this area would be visited in time by millions—millions eager for subtropical adventure, but adventure under American skies, amid American customs, and the comforts and excellent direction extended to all by the governmental supervision of the National Park Service of the Department of the Interior. The leading citizens of Florida and many residents of other States are urging this important and needed project, which of course is for all the people of the Nation.

AN ENJOYABLE ROUTE KNOWN TO FEW AS YET

Florida's map resembles no other State's. In all America there is no terrain so unusual, yet often so uniformly monotonous, as one sees en route from Pensacola to Key West. From Jacksonville a small boat may cruise all the way down to the last big key, and even far out to the reefs on the way to Havana, broadly speaking, in sheltered waters. Indeed, scores of yachts and houseboats, large and small, migrate from New York to Florida every fall, following what is known as the Inland Route, through canals to Chesapeake Bay; thence to Norfolk, again entering canals and shallow sounds behind Hatteras to Beaufort, North Carolina; and there, awaiting good weather and sea, slip down outside to Charleston, and then inland again to Palm Beach and Miami, thus to see and enjoy in a leisurely way the living charm of our South Atlantic coastal country, which is little known to train or even automobile travelers.

Shore lines of keys and islands alone measure about 1,000 miles. Certainly, Nature gave the map-makers a real job when she designed Florida. To-day's map, evolved through generations of pucker-browed cartographers, differs much from one issued in France as late as 1750, showing high mountain peaks in the Everglades!

SCORES OF TROPICAL TREES AND PLANTS HAVE MIGRATED TO FLORIDA

Laved by the sun-warmed, mysterious waters that swirl ceaselessly about it, and sweetened by the soft, pure trade winds that breathe life upon it, Florida is like a giant hothouse. It forms to the imaginative eye a big experimental farm for all America. From 51 foreign lands plants and trees strange to us have been brought here to take up a new home and many are already adapted to our use.

From Surinam to Singapore, Uncle Sam's explorers have searched the nooks and crannies of the tropical world. As men in Bible times went forth in quest of camphor, incense, and myrrh, so these

Photograph by Clifton Adams

ON BALMY WINTER AFTERNOONS A ST. PETERSBURG PARK AUDIENCE LISTENS TO THE CITY BAND

When the open-air concert is finished, lovers of debate remain for an "open forum." Volunteer speakers choose affirmative and negative sides of current questions. Religion and over-controversial themes are barred, yet a mild Hyde Park liberty of speech prevails.

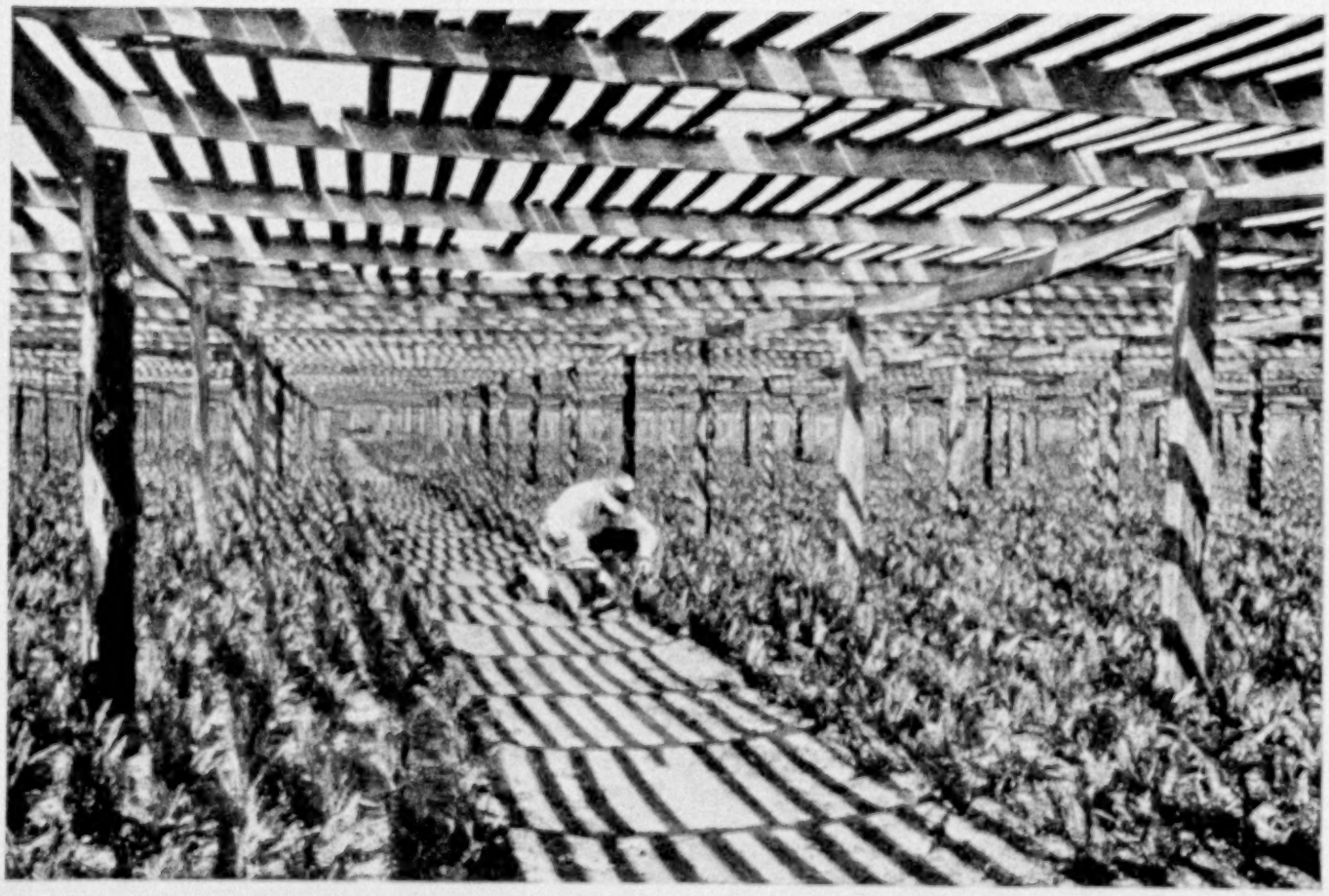
Photograph by Burgess Bros.

SUNDAY COMMUNITY SINGING ON THE MUNICIPAL PIER AT ST. PETERSBURG

Remindful of the song festivals of central Europe, thousands of tourists from Iowa and Indiana, Pennsylvania and Canada, gather here each Sunday afternoon. Printed on small sheets, the words of familiar old songs are passed to those attending.

ELEMENTARY CLASSES IN THE OPEN AIR

On rainy days, which are rare, the classes of course are held in the near-by schoolrooms. Most Florida cities and towns also have splendid school buildings, but their architecture is invariably planned to give a maximum of air and light, which spell health and happiness.



Photographs by Clifton Adams

RAISING FERNS FOR NORTHERN DECORATIONS

There are several varieties cultivated for far-away florists and here are seen many acres grown under slats, as in the case of tobacco.

dauntless botanists have hunted, found, and brought to Florida various exotic plants and trees whose fruits we may use as food or medicine. At the home of one famous American botanist in Coconut Grove, Dr. David Fairchild, was served a vegetable lunch all picked from plants with odd names utterly unknown here two decades ago.

Here is the jackfruit of Ceylon, and the macadamia, a fine table nut from Australia; the chayote vine from the mountains of Guatemala, which bears the favorite vegetable of the Indians of that land; here is Livingstone's garcinia, a delicate maroon-colored fruit discovered in East Africa by the great missionary; here is the sapote, or chewing-gum tree, from Yucatan, and the lychee, or favorite fruit of South China; here, also, are, of course, mangoes, papayas, and avocados, and the chaya of Central America, whose young shoots are as delicate as spinach.

SUN BATHS ARE POPULAR WITH FLORIDA ADVOCATES OF HELIOTHERAPY

"Sun Worshipers," these modern disciples of Zoroaster style themselves. In separate inclosures for men and women, devotees of the sun cure lie for hours each day on camp cots. Many leaders in medical science indorse the curative value of the direct sun rays.

In pioneering vegetable gardens one sees the popular taro and yautias, reminiscent of hillside taro patches in Hawaii; the manihot, chief food to millions of tropical peoples, who eat it as we do potatoes; great bushes of "pigeon peas" from the West Indies—the pea which, when ripe, forms an ingredient in that famous Bahama Islands dish, "hoppin' John."

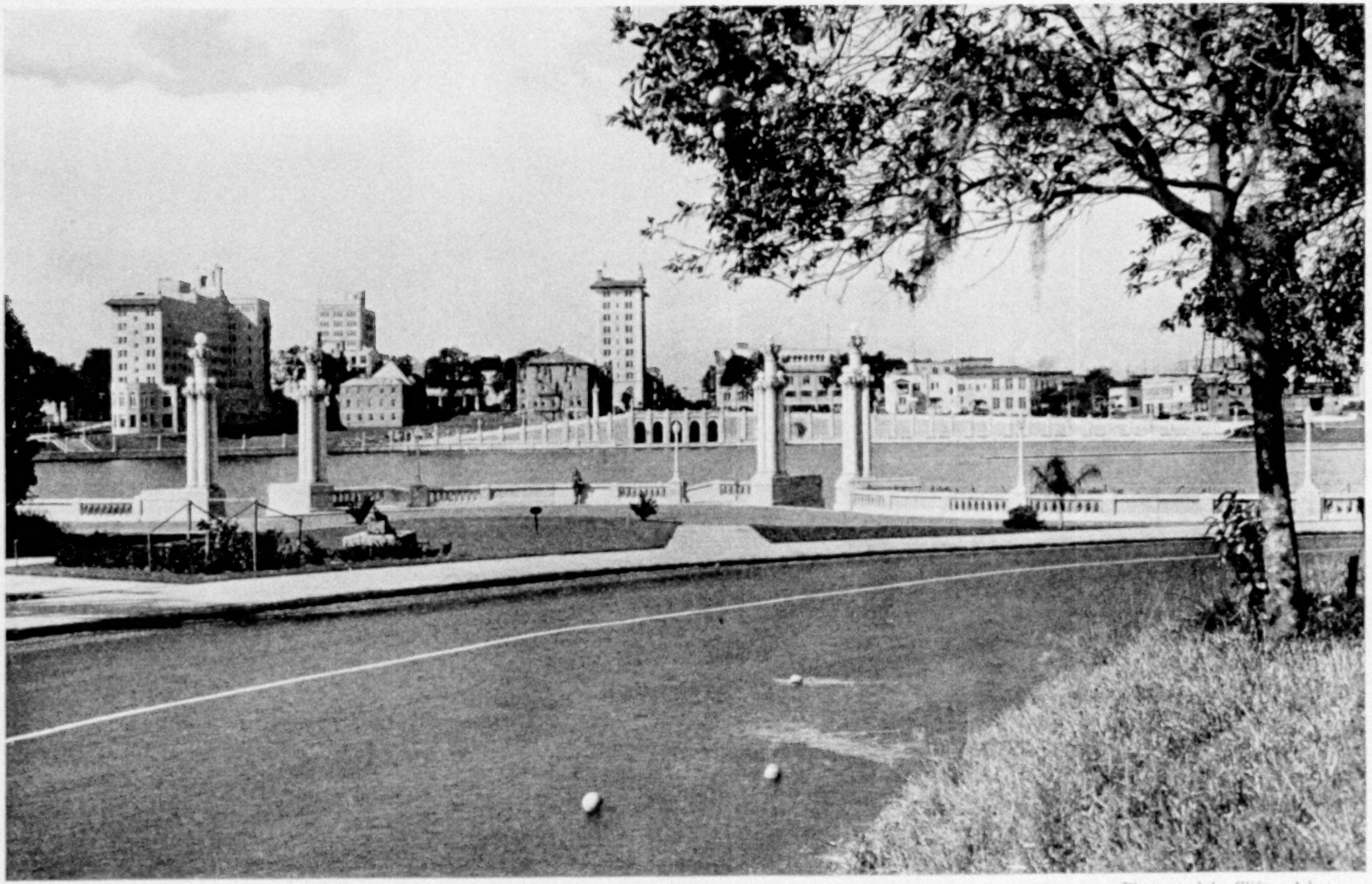
Besides these, there is the famed *m'chopo*, or Zulu fig (*Ficus utilis*), from whose bark Congo women make their dresses; the candlenut-tree from Polynesia and the lebbek tree from the avenue planted by the Khedive in honor of the Empress Eugénie when she visited Egypt.

Here, also, is the *Limono ponderoso*, or giant lemon. I saw it thriving near Miami, but not as yet on a commercial basis. It is literally too big. A woman who had some growing in her garden told me she "made 14 glasses of lemonade and three pies out of one lemon," and I doubt not her statement after seeing their size.

Photograph by Clifton Adams

THIS WELL-CONDUCTED SCHOOLHOUSE NEEDS ONLY A CLEAN FLOOR

Going to school should lose some of its hardship for the scholar when the dog seen in the foreground can be so near his young master. Outdoor class at St. Petersburg.



Photograph by Clifton Adams

LIKE THE ORNATE ENTRANCE TO SOME VAST VENETIAN PALACE LOOMS THE CIVIC CENTER OF LAKELAND

Rising on Mirror Lake like a fairy city on an iridescent sea, Lakeland, for its size, presents one of the most charming appearances of any city in the South. It is in Polk County, seat of a vast citrus industry.

Photograph from George P. James

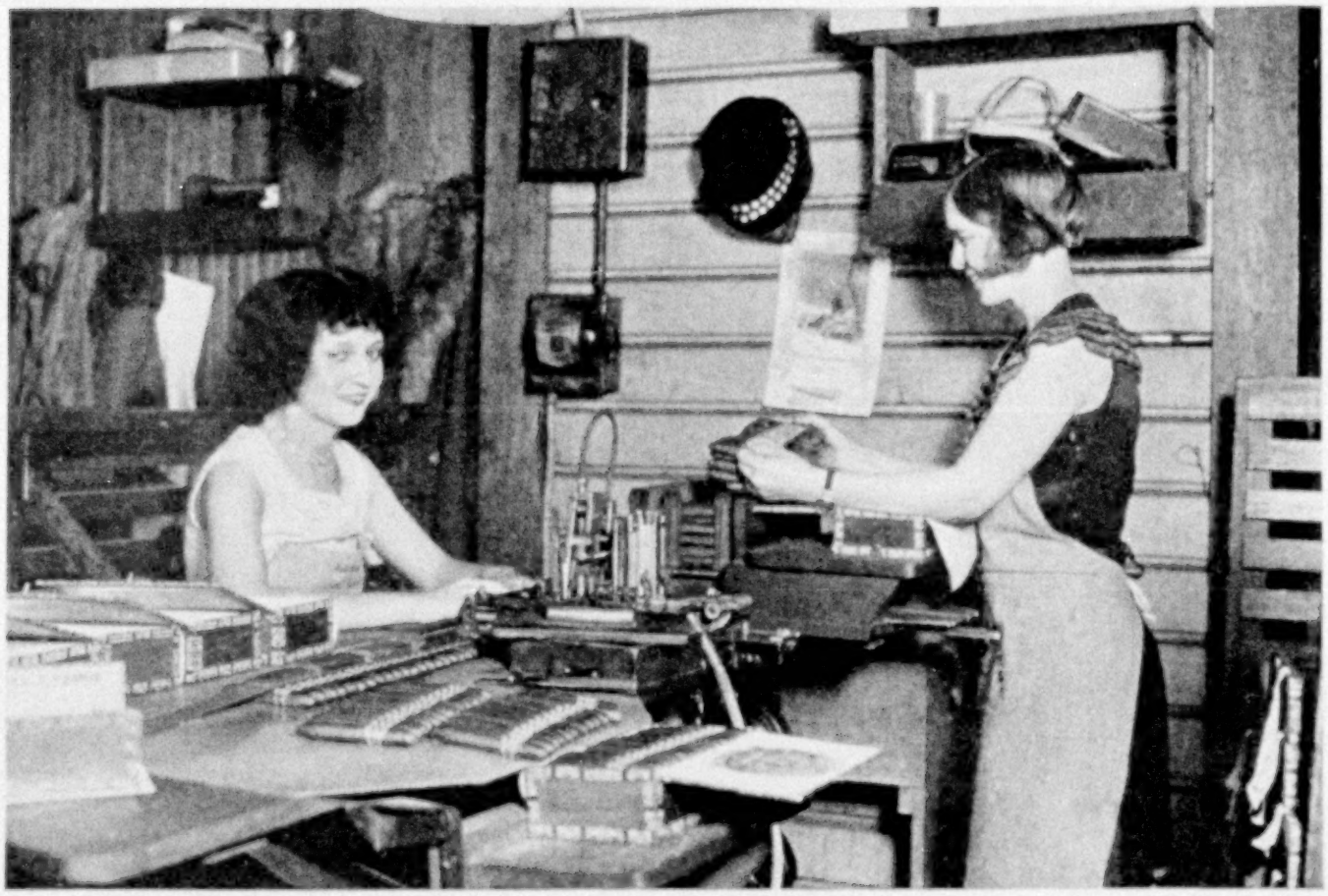
DREDGING PEBBLE PHOSPHATE ROCK IN THE WORLD'S LARGEST KNOWN DEPOSIT: POLK COUNTY, FLORIDA

Phosphate rock, acid, and commercial fertilizer with a phosphate base are major items in Florida's exports. More than 1,500,000 tons of phosphate are shipped annually through the port of Tampa, and Polk County sales exceed $10,000,000 a year.

Photograph by Orville K. Blake

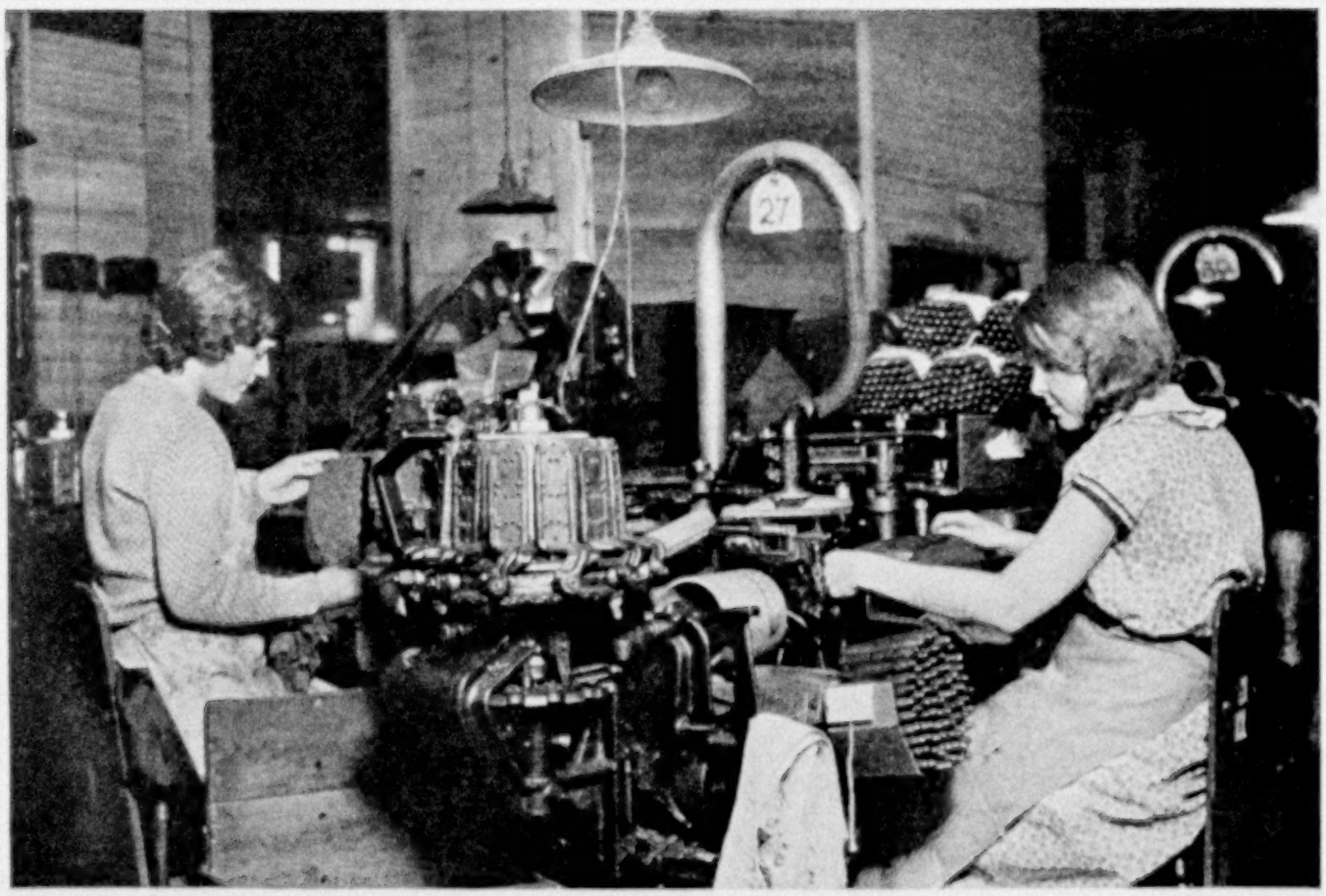
ONCE AN INDIAN VILLAGE, TAMPA TO-DAY, WITH ITS MANY FACTORIES AND OCEAN TRADE, IS CONSPICUOUS IN THE COMMERCIAL LIFE OF THE SOUTH

Its water front, fragrant with subtropical smells, berths ships from far and near. Swarthy men unload fruit, tobacco, oil, and other imports. Outward-bound, many carry phosphates, turpentine, lumber, and general cargo. Tampa toils, spins, and also profits.



CIGAR-BANDING MACHINE AND TWENTIETH-CENTURY CARMENS

Two girls take the finished and graded cigars, band and repack them in the standard boxes, on familiar display at every cigar stand.



Photographs by Clifton Adams

A CIGAR-WRAPPING MACHINE IN ONE OF TAMPA'S LARGEST CIGAR FACTORIES

Two girls operate a machine. The capacity of each of these machines is 4,000 cigars per day. In October of 1929 a production record of more than 54,000,000 cigars was achieved in Tampa.

Photograph by Clifton Adams

SPANISH CIGAR MAKERS HAVE EVER HAD A TASTE FOR LITERATURE

One day the lector, or reader, may give way to a radio loud speaker, but that time is still in the distant future.

Another strange visitor is the *Monstera deliciosa*. It grows a queer, cucumber-shaped fruit. An interesting characteristic of this plant is the big holes in its leaves, like a lace pattern. One wit suggested that Nature provided these holes so that bugs may pass from one side of the leaf to the other at their convenience. The big fruit has a spicy flavor suggestive of apples and bananas.

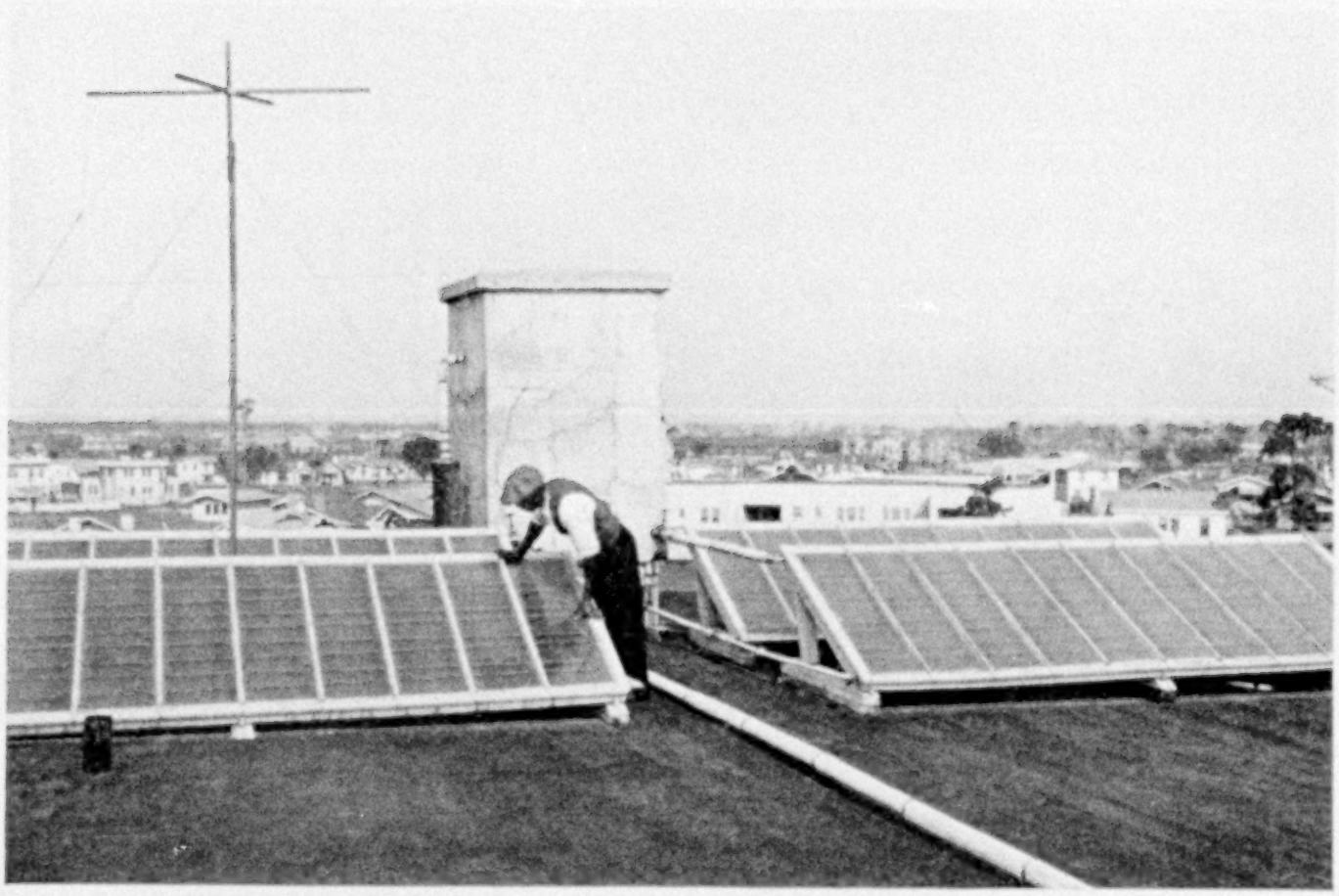
In his haste to clear land for the sites where new homes and towns now stand in south Florida, man of necessity destroyed much of the original growth of cabbage palms and the dense hummock jungles, with their many trees, strangler figs, and undergrowth of ferns. But for the botanists bringing in beautiful flowers, trees, and shrubs from all over the tropical world, and the richness of the muck soil, these newly settled regions of Florida would be unsightly in their bare ugliness.

Instead, now painted against a background of green grasses many of which are also imported, and now against backgrounds of stucco houses and garden walls, one beholds the riotous brilliance of many-hued bougainvillæa, named for a great French admiral; the Saharan oleander, the gorgeous flowering cassias from Siam, the flame tree of the Caribbean, the red-flowered hibiscus, the poinsettia, and a host of others. Here, too, is the sacred bo tree from India, the remarkable psychotria from the Comoro Islands, which carries bacterial nodules in its leaves instead of its roots.

FOR THE BENEFIT OF THE NATION

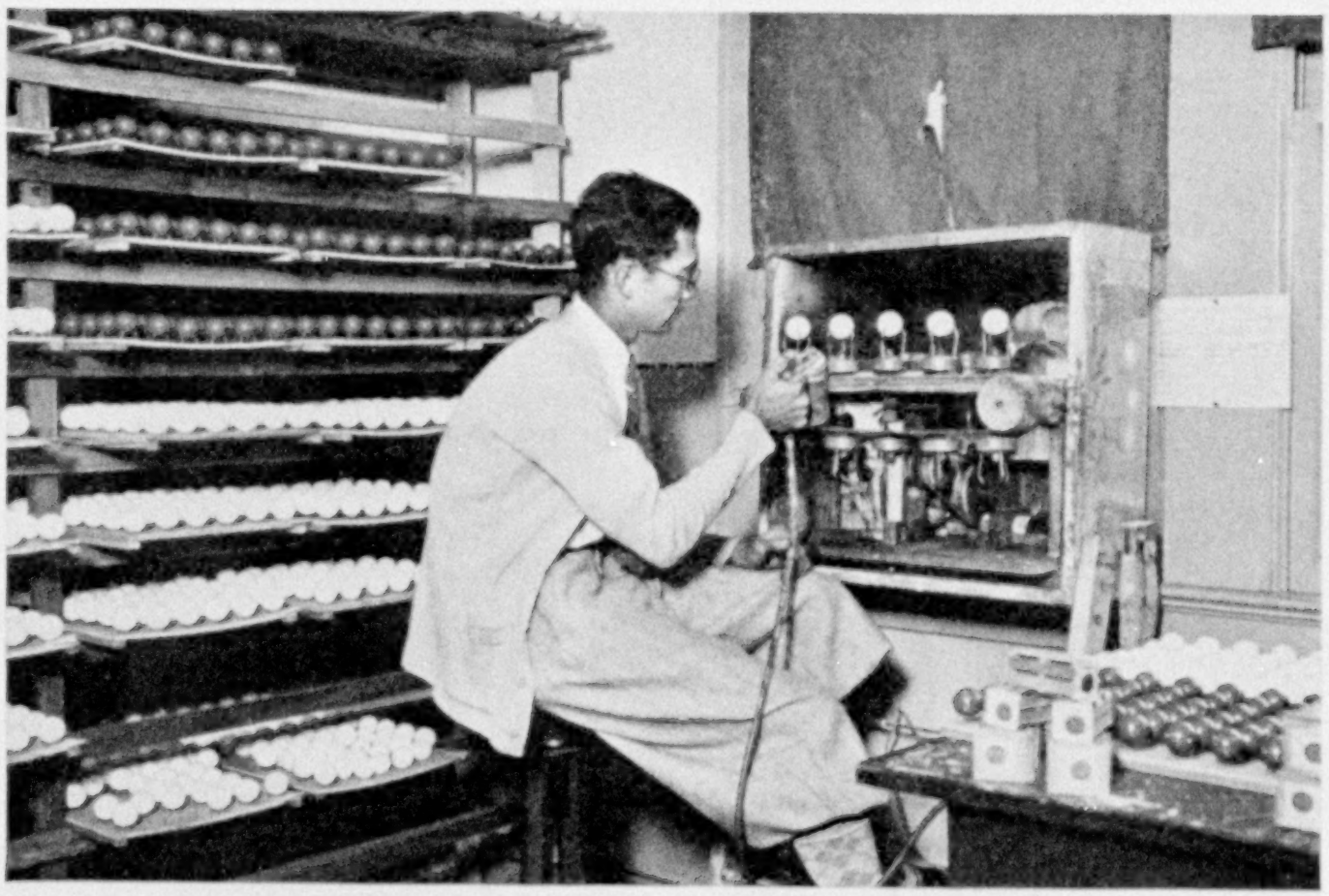
From such exotic immigrants of the vegetable world many small plant oases are forming in Florida. About them there also gather many kinds of tropical insect pests, and tiny animals that feed on the plants. So here, to care for these imported plants and trees as well as the vegetable gardens and citrus orchards of Florida, an intensive science of tropical entomology is being fostered. This work against citrus canker and other pests is of measureless value to the whole Nation.

Follow the Equator around the world, and in many cities near it one may see botanical gardens, maintained as show



WHERE THE SUN DOES THE WORK

Solar heaters installed on the roof of an apartment. Fireless heaters are popular throughout the State, which boasts of so many hours of sunshine each day. Water, circulated in the pipes through the heating boxes, is stored in an insulated tank ready for use at a temperature just short of the boiling point.



Photographs by Clifton Adams

TINTING THE ELUSIVE PILL

Spraying golf balls with paint in a Tampa factory. Some of the balls are painted bright orange to increase visibility in grass and sand traps.

Photograph by George M. Chapin

THE MAN IN THE IRON MASK AND STAFF

A group of stalwarts who make up the small army of expert sponge fishermen and divers at Tarpon Springs. In many cases the professional divers train their sons and nephews, and thus hand down their skill from generation to generation.

places only. But there is no other region even approaching south Florida in size where tropical and subtropical plant life is cultivated on so vast a scale, with strict quarantine and funds for fighting parasites, experimenting with new varieties, and raising their culture to a commercial scale. It is easy, for example, to plant apple trees and then take the book-written trail of apple-growing. But to pioneer a new fruit industry, as in the case of the mango, avocado, and papaya, and to have to work out for the first time in history the problems of fertilization, pest combat, as well as the sale of the fruit to a public unfamiliar with it, is quite another undertaking. Florida is doing that and Uncle Sam is helping, advising, experimenting, encouraging with his scientists.

Others, also, are working here, independent of Government aid—working from sheer interest in what Florida, the plant laboratory, can produce. Some of these are men from the North, wealthy through previous activities. Moved by normal man's love of agricultural adventure, you find among them types of high-geared and well coördinated mental engines, who put the same skill and science into growing tomatoes, breeding cattle, and fighting plant pests that they once put into building subways or running chain stores. Farming in Florida, as elsewhere, is beset by puzzling problems. Yet, with so many good minds pondering these problems, it is inevitable that many will be solved for the economic good of all.

There is "Mankind's Friend," Thomas A. Edison, in his laboratory at Fort Myers. He seeks a native source of rubber. Thousands of latex-yielding weeds, vines, and trees have been tested. In a fireproof vault, on indexed cards, the results of all tests are preserved. Walking through his garden plots, one sees common field weeds of the Middle West—the same obnoxious weeds which we used savagely to pull up and hurl away from the garden patch—being carefully nursed here for experimental use. Beside them grew other weeds, shrubs, and trees from far and near. Season after season the aged wizard's quest

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HERE SPONGE IS KING

A general view of the sponge fishing fleet at Tarpon Springs. Belonging to the animal kingdom, the sponge breathes and feeds by the contraction and expansion of the numerous channels within its body. Sponges fasten themselves to pieces of shell or other objects at the bottom of warm waters and are scientifically planted and harvested year after year, as in the case of oysters.

XUM

Photograph by Burger and Bros.

PLANTING SUGAR CANE IN THE "MUCK" SOIL OF THE FLORIDA EVERGLADES

Certain areas in the Everglades, as on the rim about Lake Okeechobee, have proved suitable for sugar-cane growing. This so-called "muck," when drainage conditions are correct, produces amazingly. Forty to fifty tons of sugar cane per acre have been cut.

goes on in this same laboratory, where in forty years past so many of his great inventions have been perfected. Some day he and his assistants may find a source of native rubber, not necessarily in quantities to meet all our needs, but rubber for use in emergency, when other producing areas are closed to us.

FROM CHINA THE TUNG-OIL TREE HAS COME TO FLORIDA

Besides the culture of new plants, there are costly private ventures in animal husbandry, reforestation, intensive farming, and group efforts at more efficient picking, packing, and marketing methods. From that admirable institution, the Florida Department of Agriculture, at Tallahassee, there issues a steady stream of bulletins and periodicals on what and when to plant, how to raise it and sell it at a profit—and, just think, alleged humorists used to call native Floridians "crackers."

For decades we have used "wood oil," brought from China and other foreign countries for use in our paint and varnish industry. In China, besides its use in soap-making and for waterproofing, settlings of the burned oil make the "India ink" of commerce. Does it surprise you to know that we import the oil from the tung nut to the tune of $10,000,000 to $15,000,000 annually?

Now, as you approach Gainesville and in the neighborhood of Green Cove Springs, Florida, you may see long rows of tung or wood-oil trees, as flourishing here as in a similar latitude in China. They grow in the most unlikely looking ground and their oily proclivity repels insect life.

Some years ago American consuls in China, coöperating with our Department of Agriculture, introduced the seeds of this tree. True, this industry is only in its infancy. Yet it affords another example of Florida's value to the Nation as an experimental plant laboratory that will one day not far distant stand out in the development of home industry.

Among exotic fruits that have found a foothold here is the avocado, often called "alligator pear." In old days South Sea sailors called it "midshipmen's butter."

Years ago this fruit was first brought to Florida from Mexico. Since then other selected varieties have been imported. Tons of this healthy, valuable table delicacy are now shipped to Northern and Midwest markets from the Peninsular State.

The avocado grows on a tree and is shaped like a pear, but its taste is not that of a fruit; it resembles more a delicate vegetable or even a nut. Since a taste for it usually has to be cultivated, the avocado has often been compared with an olive. Its food value is very high. In Central America and in tropical isles to which it is native, it forms a common article of food. "No other fruit," says a great governmental agency, "not excepting the olive, equals the avocado in food value. It is equal, pound for pound, in ability to sustain life, with lean meat."

ODD AND INTERESTING ARE SOME INDUSTRIES IN THE STATE

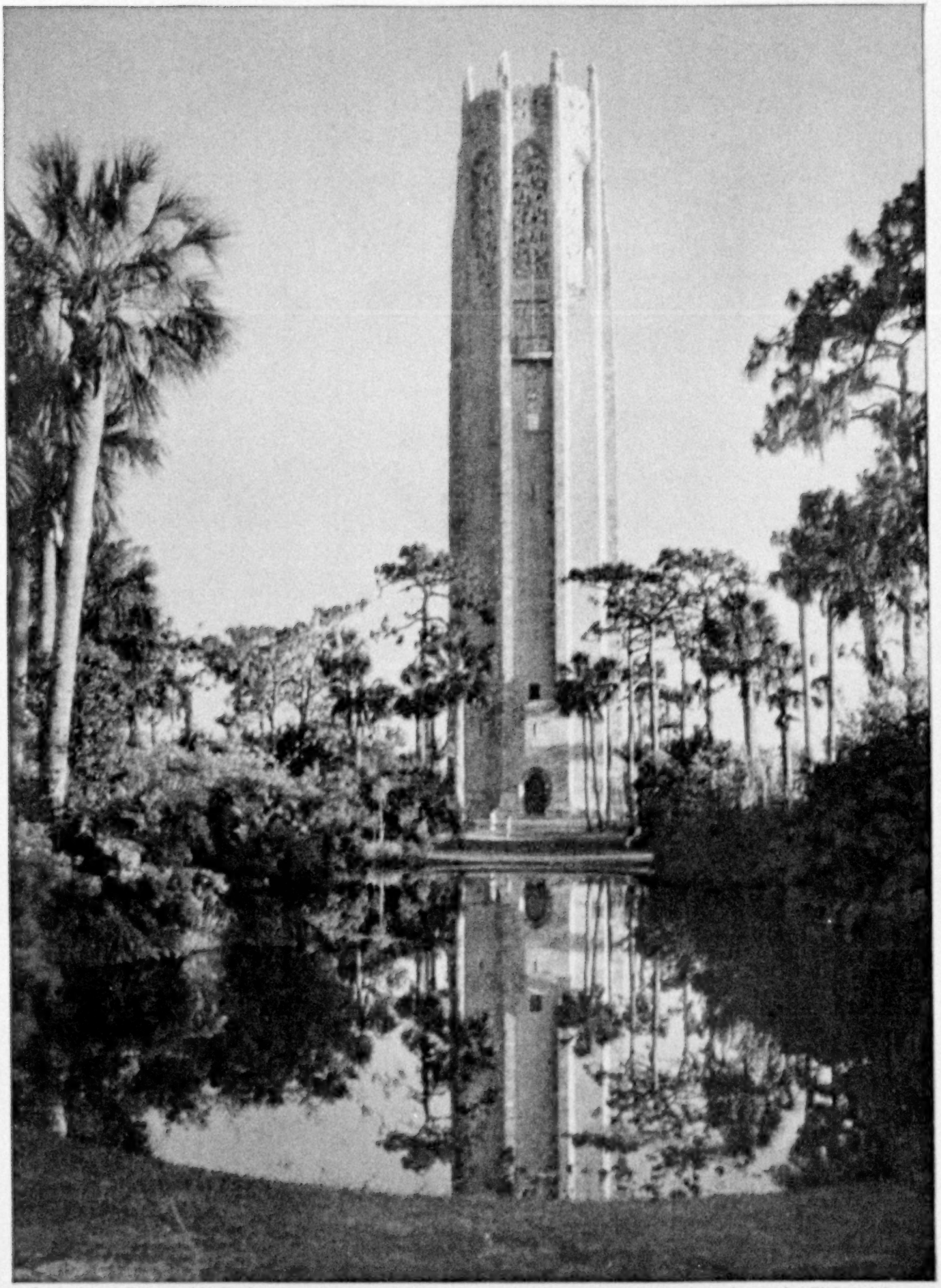
No smoke pall hangs over Florida. Peradventure more grime and pungent factory smells would be a welcome tonic for the State's commercial progress; yet what factories lack in size they make up in variety. Output ranges from toys, turtle soup, and turpentine to shiploads of dressed lumber, phosphates, and cigars. For even more contrast, add many linear miles of snake and alligator skins, wooden shoes, and canned grapefruit jellies and marmalades.

One mill at Jacksonville grinds oyster shells and ships them by the carload to California, to help the digestions of Pacific coast poultry; another makes glass bottles for Cuban breweries.

Palm fronds by the carload go as far north as Canada, for use on Palm Sunday. Palmetto fiber is made into brushes. A college student pays his way by stuffing baby alligators and selling them to tourists. He stuffed 300 in one season—alligators, not babies!

Men wade on the bottom of the sea, picking sponges as a farm boy pulls turnips. They are scientifically farmed and are shipped the world around.

Schooners cruise as far away as the coast of Honduras, catching sea turtles. Unloaded at Key West, these turtles are first branded on the breastplate with the initials of the local fishing company; then they are put into big tanks and fed on



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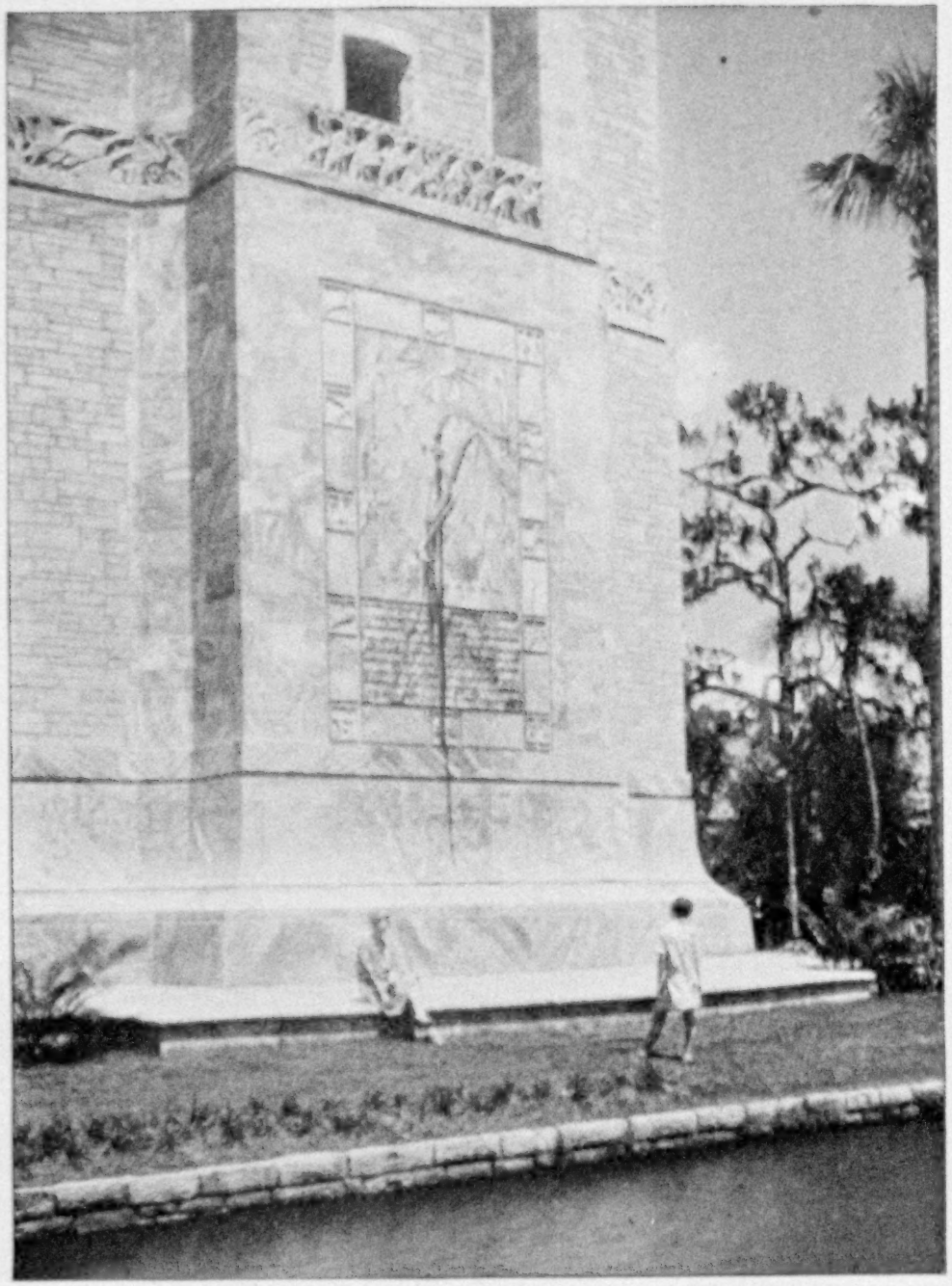
STILL WATERS REFLECT THE GLORY OF FLORIDA'S "SINGING TOWER"

From atop this majestically beautiful structure a superb carillon fills the air with golden melody that blends with notes of the birds in whose sanctuary it stands. The 205-foot tower of steel, Georgia marble, and native Florida stone, is located at Iron Mountain, the highest point in the State. Both tower and sanctuary were the gift of Edward W. Bok to the American people.



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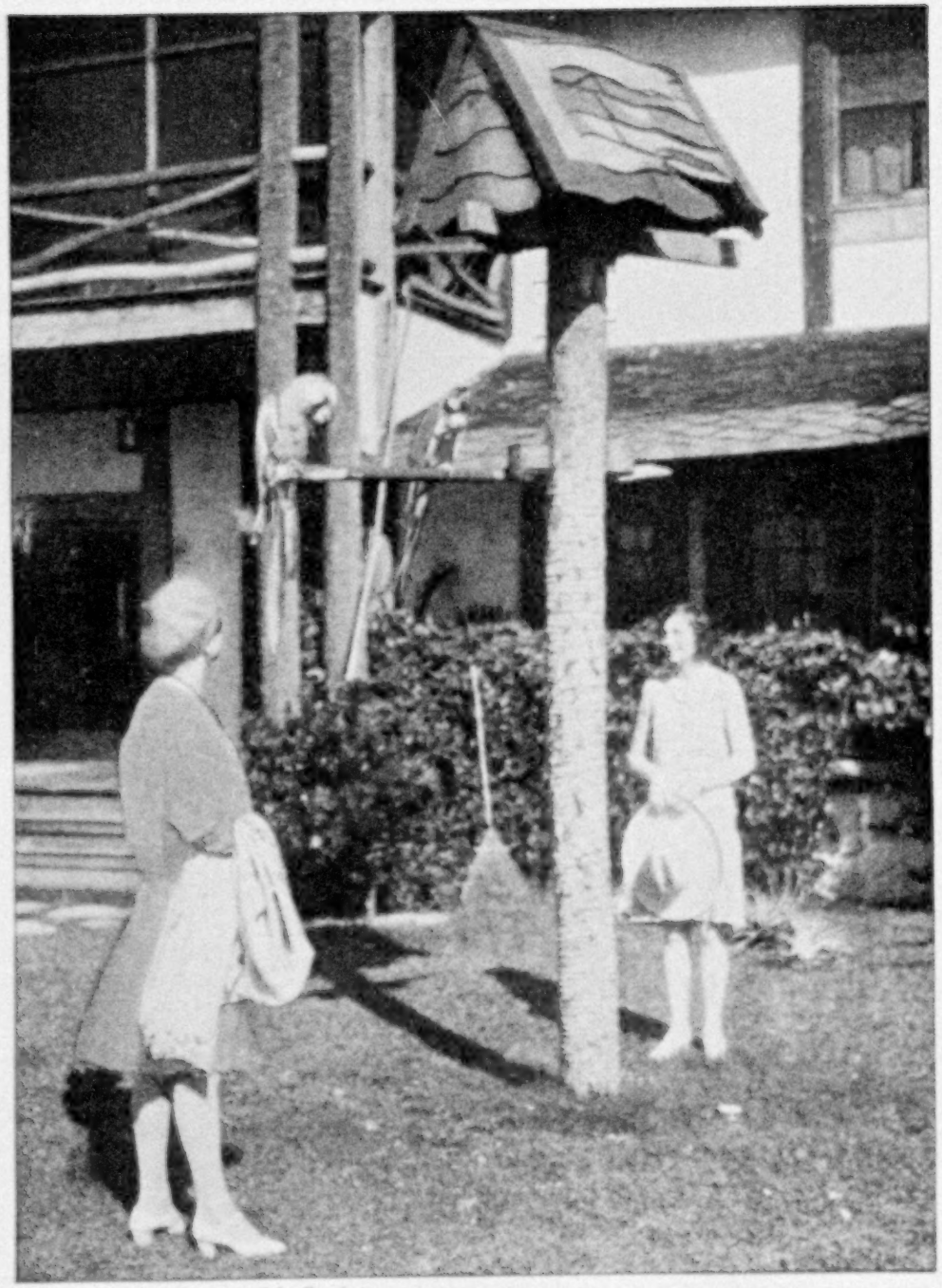
SUNDIAL AND SEA HORSE ADORN THE CARILLON TOWER AT IRON MOUNTAIN

The dial on the south wall shows time of day and the day of the month, a table at its base indicating the difference between sun and clock time in that latitude. The colored tile sea horse is symbolic of Florida's marine life.



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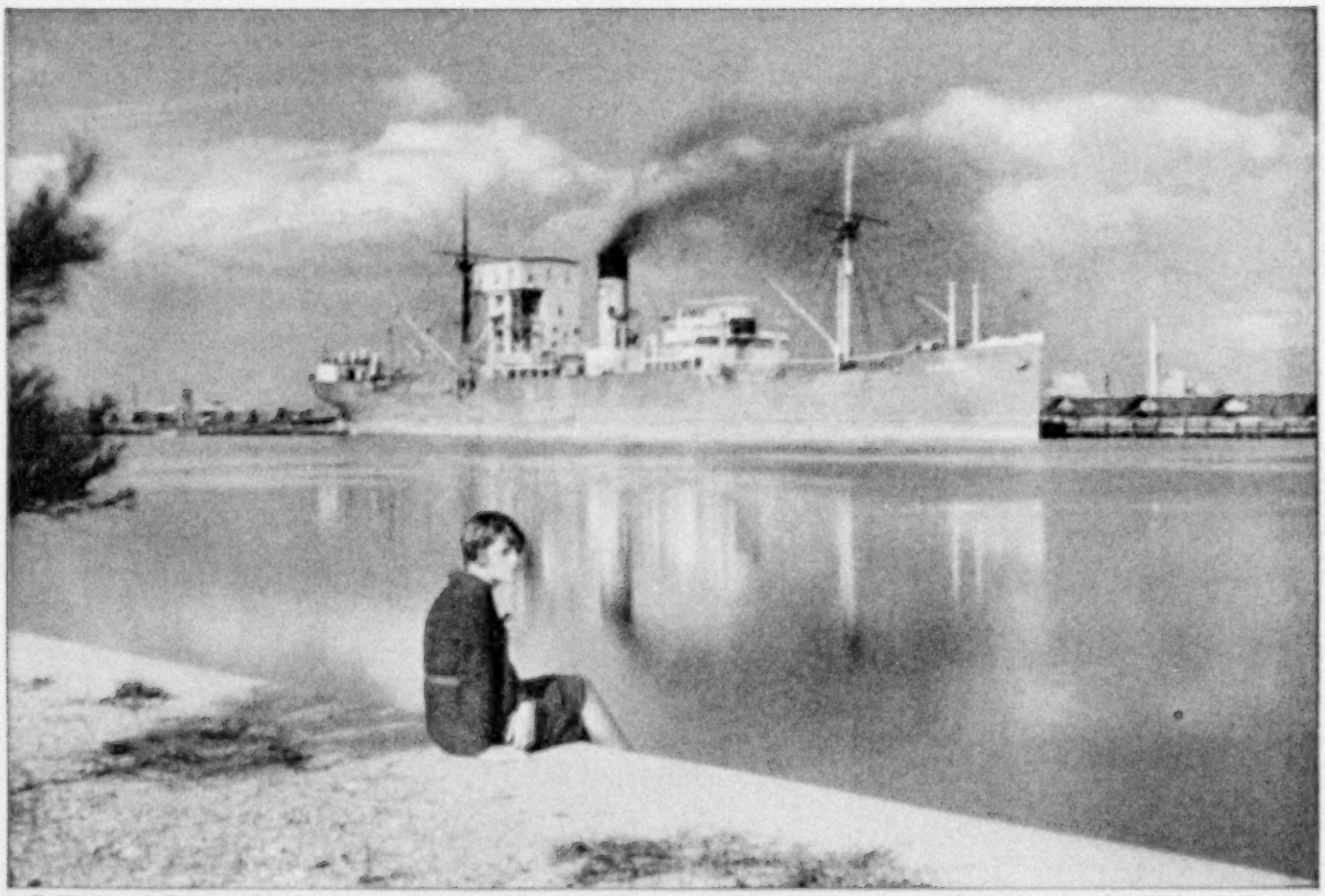
GAILY COLORED MACAWS NEVER FAIL TO INTEREST VISITORS AT BRIGHTON

Autochromes by Clifton Adams

IN APRIL THE OLD-FASHIONED GARDENS ALONG THE ST. JOHNS RIVER ARE BRIGHT WITH AZALEAS

MASSES OF LIVING FLAME SCREEN A ST. PETERSBURG GARDEN

The bignonia blooms all over the State in winter. Its vivid color has earned it the soubriquet flaming trumpet or flame vine.



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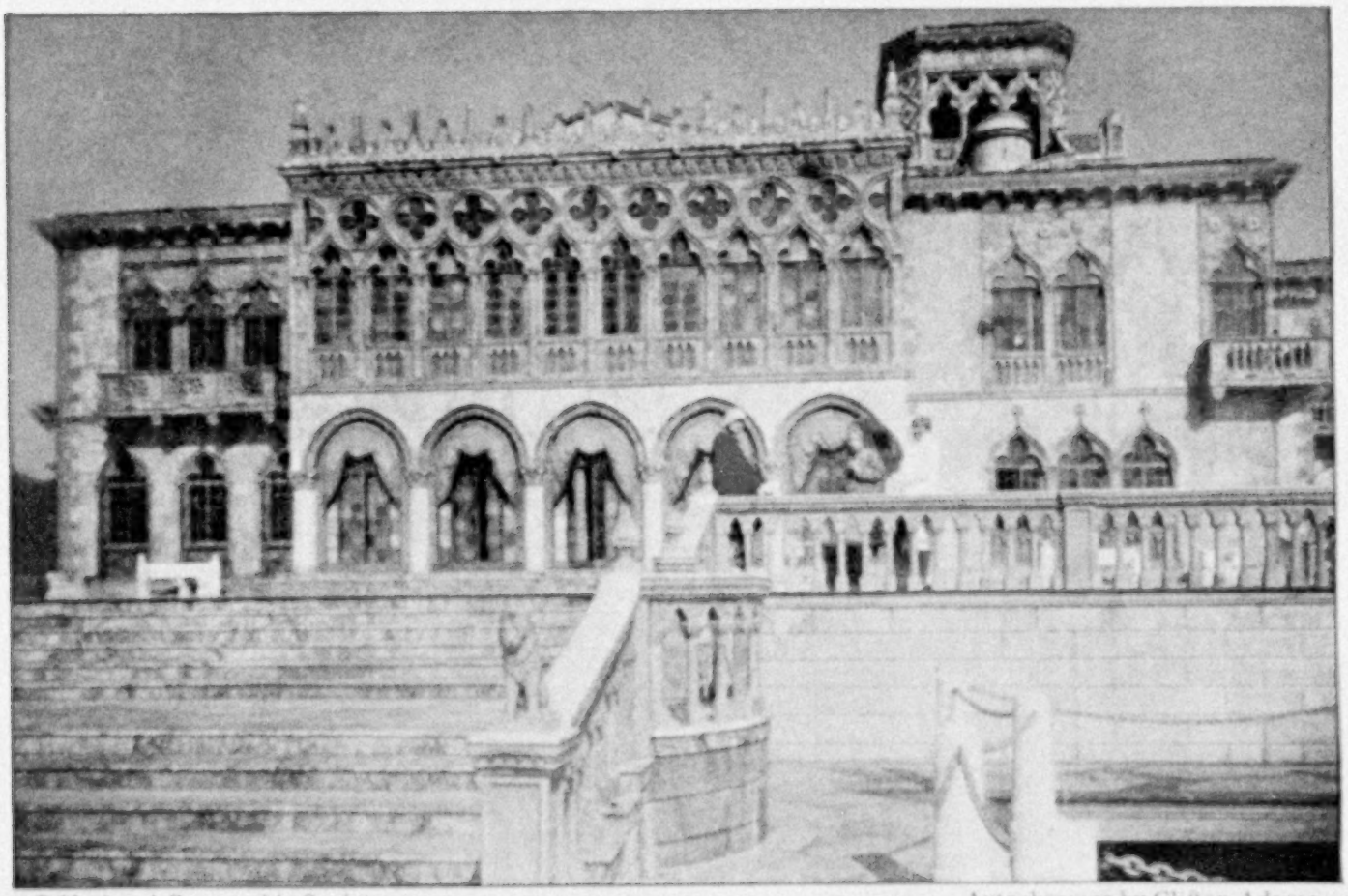
SHIPS FROM THE SEVEN SEAS COME TO TAMPA

Phosphate rock is the magnet which draws many great ocean freighters to the fine harbor of Florida's leading west coast port. Extensive deposits are easily accessible to the sea, and more than a million and a half tons were loaded at Tampa in a recent year.

POINSETTIAS ADD THEIR CRIMSON TOUCH TO THE BRILLIANCE OF CORAL GABLES

The "Christmas flower" which dwellers in northern climes think of as a potted plant grows profusely in Florida's gardens.



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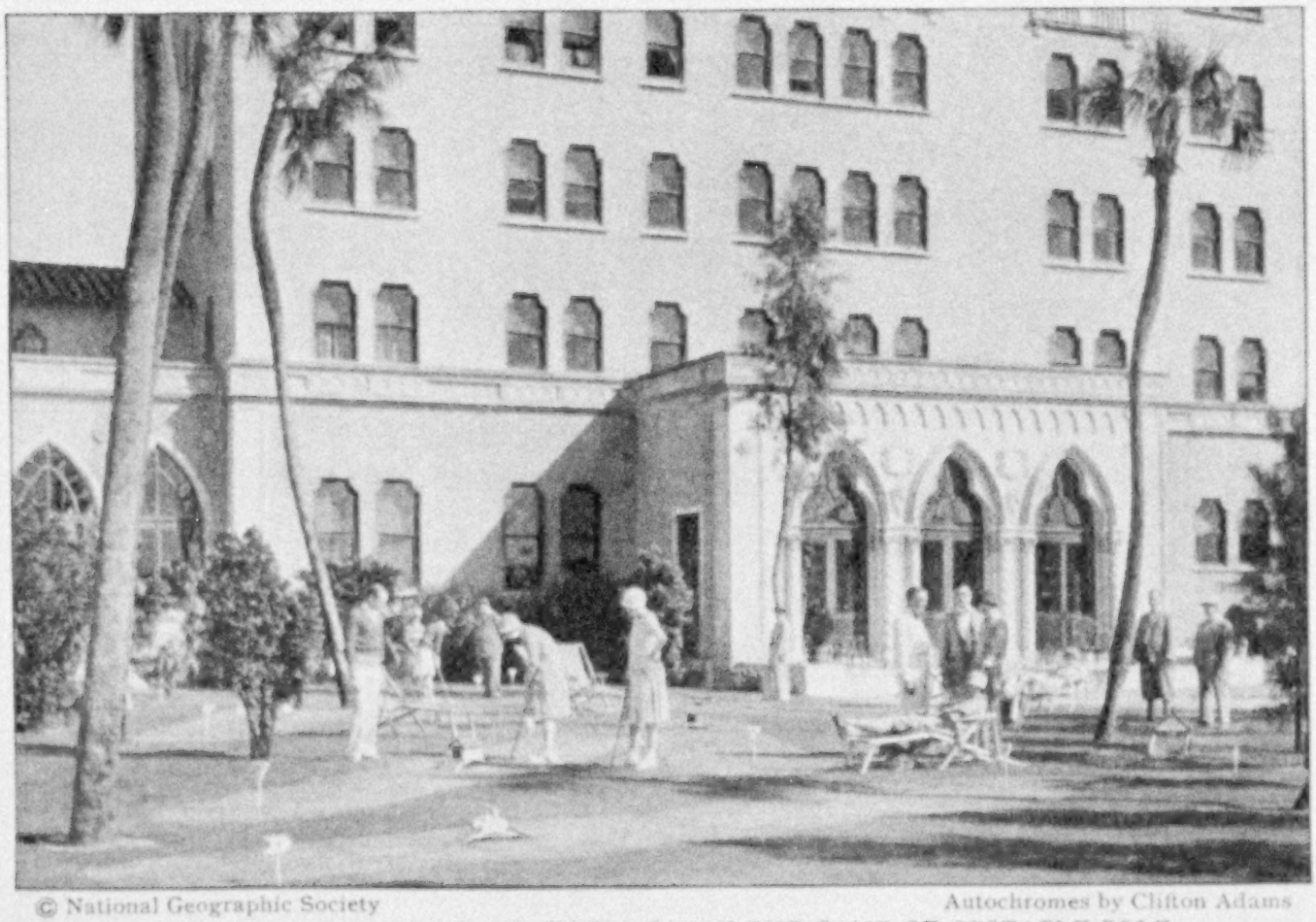
HERE THE BEAUTY AND CHARM OF OLD VENICE LIVE ANEW

Sarasota is located about 40 miles south of Tampa on the shores of the Gulf of Mexico. It is essentially a city of homes, many of which, like this reproduction of a famous Venetian palace, are extremely luxurious and attractive.

BATHING IS AN ALL YEAR SPORT IN THE "SUNSHINE CITY"

So sure of daily sunshine are the residents of St. Petersburg that one of the city's publishers gives away the entire home edition of his paper every day that the sun fails to make an appearance before it goes to press. Bright costumes on one of the white sand beaches near by.



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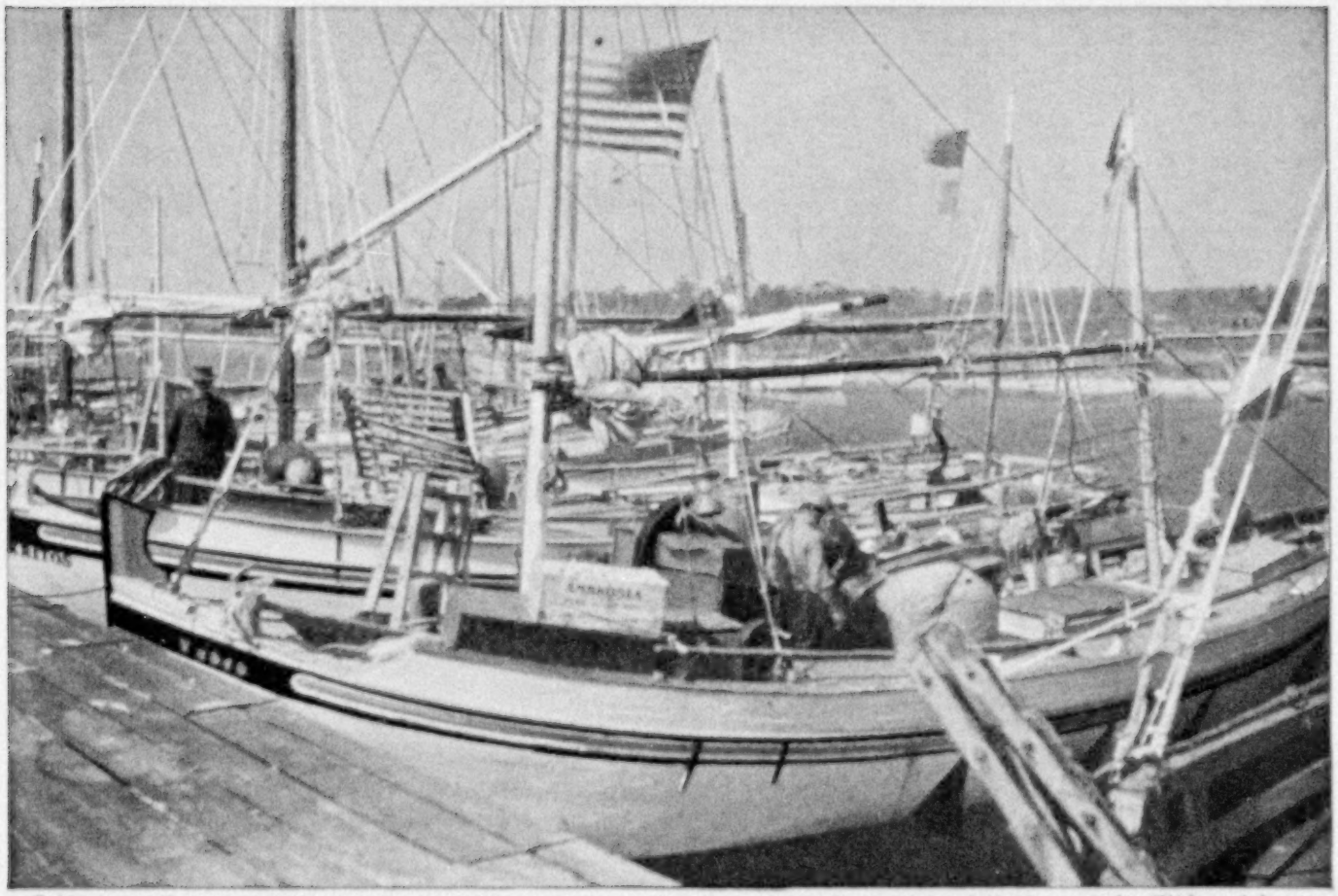
GUESTS AT A DAVIS ISLAND HOTEL ENJOY THE GAME OF OBSTACLE GOLF

This subtropical isle in Tampa Bay is man-made. With a series of small delta islands at the mouth of the Hillsboro River as a base, a land area of more than 800 acres has been built up by modern engineering methods.

FLORIDA'S CITRUS GROVES PRODUCE A VARIETY OF DELICIOUS FRUITS

Many northern breakfast tables draw their winter delicacies from our southern peninsula where grapefruit, orange, lemon, lime, citron, tangerine, tangelo, kumquat, and limequat all thrive. It is the greatest producing area in the world for grapefruit.



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SPONGE FISHERS MAKE TARPON SPRINGS THEIR HEADQUARTERS

Several hundred men and about 70 small vessels constitute the fleet that goes out from this port to harvest the waters of the Gulf of Mexico for commercial sponges. A large number of those who engage in this important commercial enterprise are Greeks.

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THE STATE MAINTAINS AN EXCELLENT COLLEGE FOR WOMEN AT TALLAHASSEE

Not all of Florida's thoughts are turned to fruit and flowers and sunny beaches, as the increasing enrollment in her institutions of higher education will attest. The State College for Women was established in 1905 and has about 1,500 students.

seaweed; later, some are sent alive to New York hotels, their flippers neatly folded across their breasts and tied; others, guillotined on a well-worn beheading block, are turned into canned soup at Key West; but before any turtle can be taken from the tank he has to pass an official inspection. Turtles may not have flat feet or suffer from nervous disorders, but now and then one is found in no condition to go to market. He is thrown back into the sea. Then, sometimes, a strange thing happens: among a cargo of turtles from Honduras, 700 miles away, one is found with the company's initials already branded on his bony breast. Condemned and thrown back into the sea, turtles, it seems, swim all the way back to Honduras from Florida, only to be caught again!

Near Quincy, in north Florida, is a big building with wheels, rollers, and hoppers, like a flour mill; but it grinds dirt—fuller's earth. Steam shovels scoop up this claylike substance by the acre. It is dried, ground, sifted, sacked, and shipped to oil refineries all over the world. Through this fine powdery dust the oil is filtered. Dry-cleaners use it to take out grease spots. It has many other uses; even the clay used in beauty shops includes it.

In beds of this earth workmen often find the bones of ancient animals. Scientists from the American Museum of Natural History dug up the fossilized body of a manatee. The remains of saber-toothed tigers, prehistoric little horses, and even of camels ages old, have been found in Florida, according to official reports.

A man sits on a high chair and reads aloud to workers in Florida cigar factories. They call him a "lector." He is an old institution among Cuban cigar-makers, like the public story-tellers in oriental bazaars. Novels, magazines, daily papers—all is entertainment grist that comes to his mill; but news of sports, and especially of baseball, is most in demand. Their brethren in Cuba demand bullfight reports.

"BUT A GOOD CIGAR IS A SMOKE"

Many cigars are made at Key West and some at Miami and Jacksonville, but the industry centers at Tampa, with its 200 factories, big and little. One of them turns out upward of half a million a day.

Much of the tobacco used is imported from Cuba. Some is grown in Florida and wrapper leaf also comes from northern States.

Cheaper cigars are made by clever machines, whose movements often curiously resemble the motions made by the hands of a human cigar-maker. More expensive cigars, of the size and shape known to the trade as coronas, royals, perfectos, panetelas, etc., are all made by hand. Three workers, sitting in a row at the same bench, form a team. They are paid by the thousand. This grouping of workers into threes is not done by the management; it is left to the cigar-makers themselves, to choose their benchmates. The finishing touch on every cigar is putting on the wrapper and pasting the closed end shut with a dash of gum.

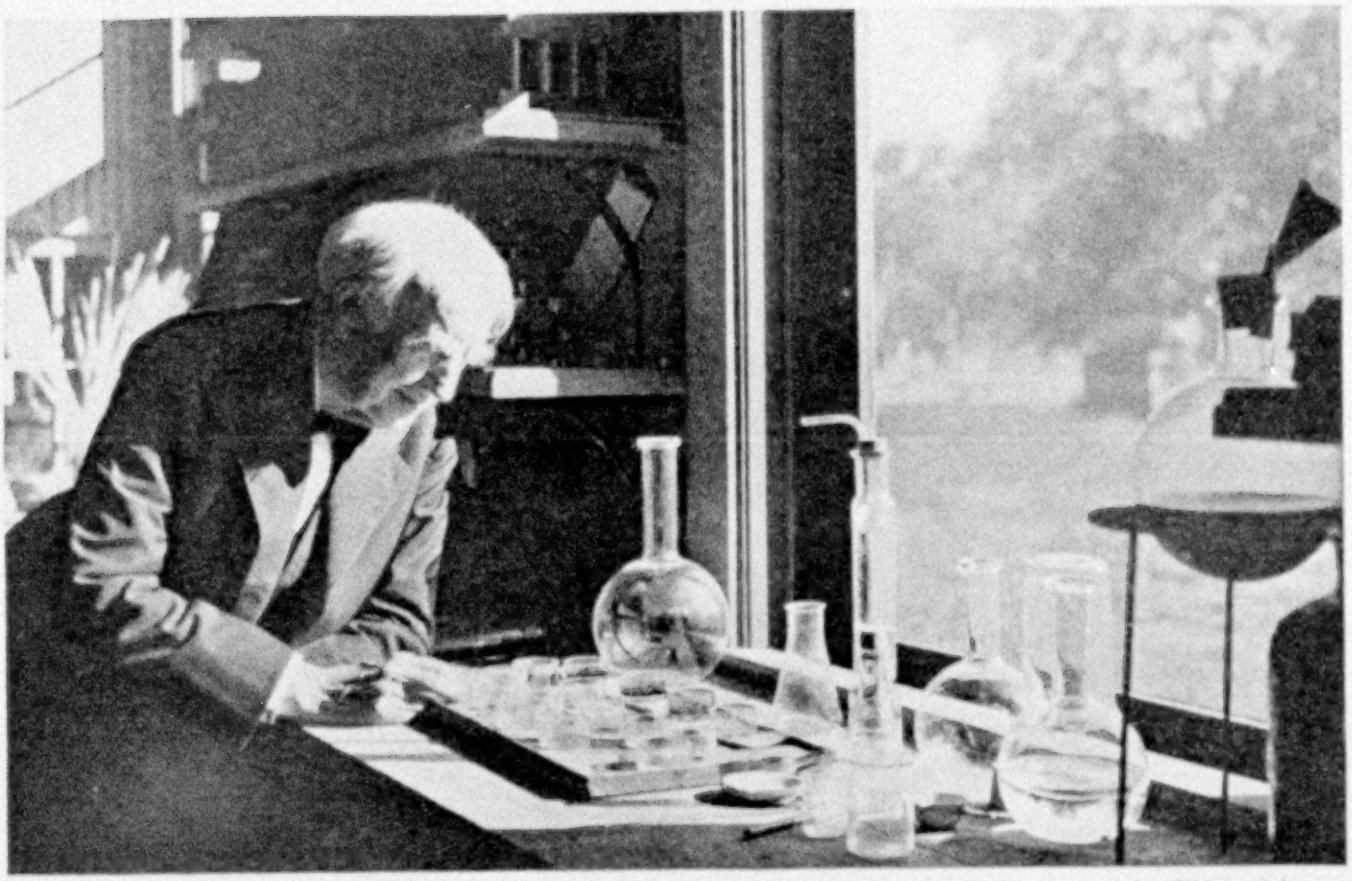
From the workbench cigars go on to bigger tables, where they are sorted for color and perfection of form. Fancy-colored bands are put on by machines, at the rate of 50,000 an hour, the whole process run by two girls. After being packed, each box is labeled and one of Uncle Sam's green revenue stamps affixed. That, briefly, from leaf to box, is how Florida makes 600,000,000 cigars a year.

IN FLORIDA'S PINE FORESTS

Thick pine woods covered all of north Florida when white men first came. To-day, at dawn, in these pine woods, the earth smells as fresh as if it had just been created. The pine was and still is the chief natural resource of the State. Lumber and its allies, turpentine and rosin, are the State's chief manufactured products.

Throughout much of all middle and north Florida you ride through forests of pine and see trees "cupped" or scarified for turpentine. Pungent fumes from wayside stills weight the air. To tap a tree and draw off its resinous gum, bark is chipped off in strips a few inches above ground; then cups of metal or clay are placed under these cuts to catch the gum. It takes many thousands of trees to keep one fair-sized turpentine mill running, which works just as did an alcohol still.

Turpentine and its associated product, rosin, are known as "naval stores" because originally their chief use was in shipbuilding. To-day turpentine goes mostly into paints and varnishes and rosin goes into paper, hard soap, and many other



Photograph by Clifton Adams

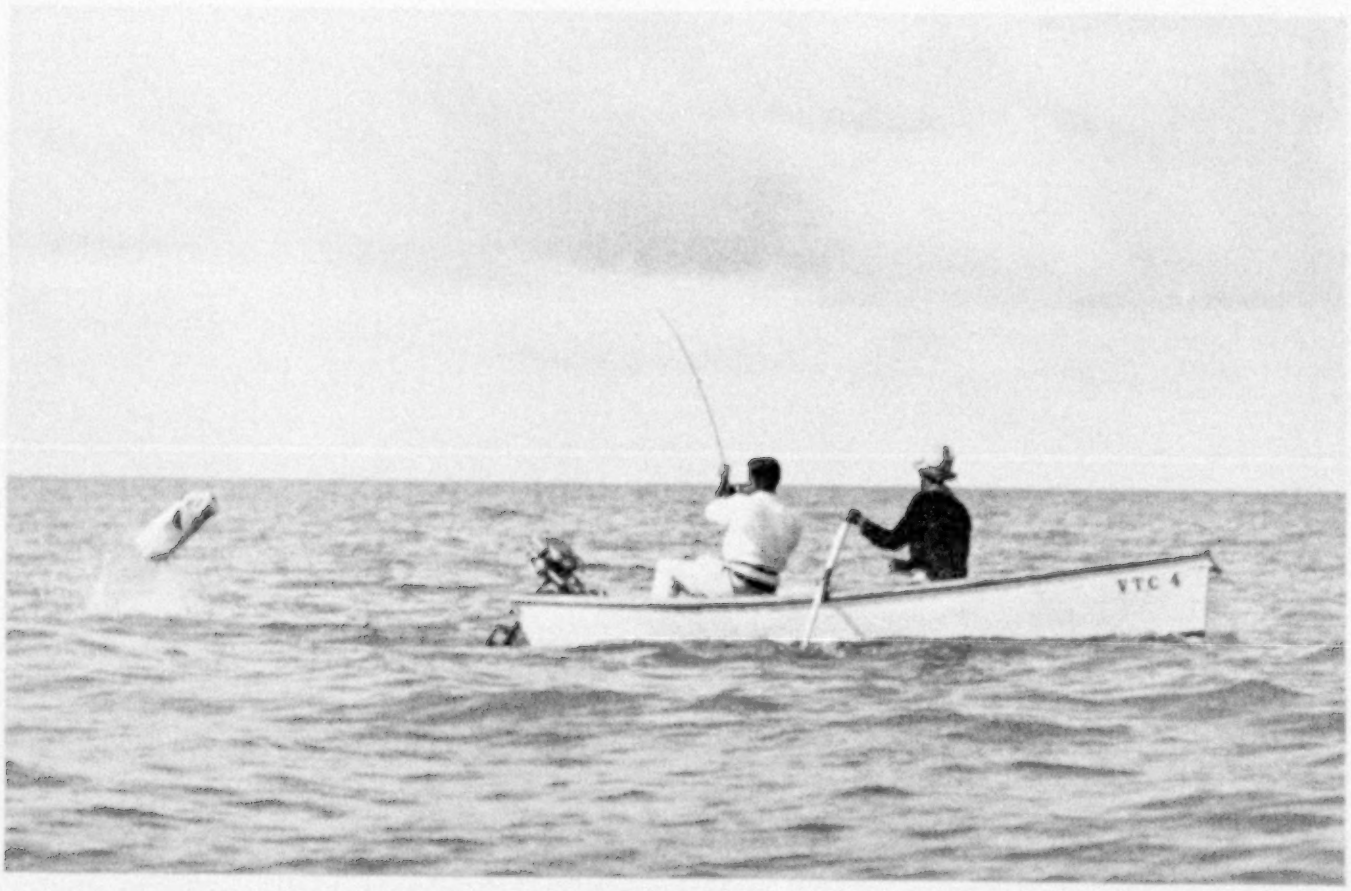
THE FLORIDA LABORATORY OF A GREAT AMERICAN

Thomas Alva Edison in his experimental laboratory near his Fort Myers home. Here the Wizard of Menlo Park and his assistants are searching for a plant with sufficient rubber content for commercial exploitation. Through the window can be seen part of the experimental garden plots in which grow many hundreds of varieties of rubber-bearing plants.

Photograph by Richard B. Hoit

FORT MYERS WAS A SMALL ARMY POST IN THE EARLY INDIAN WARS

Occupied about 1841 by American troops, the city was named for Col. Abraham C. Myers, later a distinguished veteran of the Mexican War. Its healthful climate, beautiful farming environment, and excellent fishing attract an ever-growing colony from the North.



© Venice Tarpon Club

THERE'S MANY A SLIP BETWEEN A FISH AND A SHIP

Outsmarting the "silver king" is a real sport indulged in by both sexes and on both Florida coasts. Truly, there is a thrill in every scale of this sea fighter. True sportsmen release the tarpon as a reward for its gameness.

commodities. A few big mills in the State now grind up pine stumps and other waste lumber and steam these chips in great boilers, extracting not only turpentine and rosin, but pine oil and other ingredients useful in industry and medicine.

"Fatwood" the natives call the roots, stump, and lower portions of the pine, because it burns so readily. A visitor is always amazed at the speed with which a fire can be kindled in Florida with a few splinters.

Besides various pines, Florida also yields much cypress lumber, from a tree which grows with its feet in water. Some of the world's largest cypress mills are here. There is red gum, too, and black gum, though not in quantities, and time was when Florida live-oak timbers were in much demand among northern shipbuilders. This live oak and its cousin, the water oak, are beautiful trees, especially when festooned with long, graceful filaments of Spanish moss, as one sees them along certain stretches of the Suwannee River.

The pine forests are dwindling in Florida. For years trainloads and shiploads have been exported; cities have been built and, most interesting of all, incredible quantities of lumber have been used in making crates and barrels in which to ship fruit and vegetables. In 1880 the State's lumber output was less than 250 million board feet. By 1925 it was two billion feet of pine alone, and in that year more lumber was used in packing fruit than the whole State's output in 1880! During the boom in 1925-6 lumber had actually to be imported.

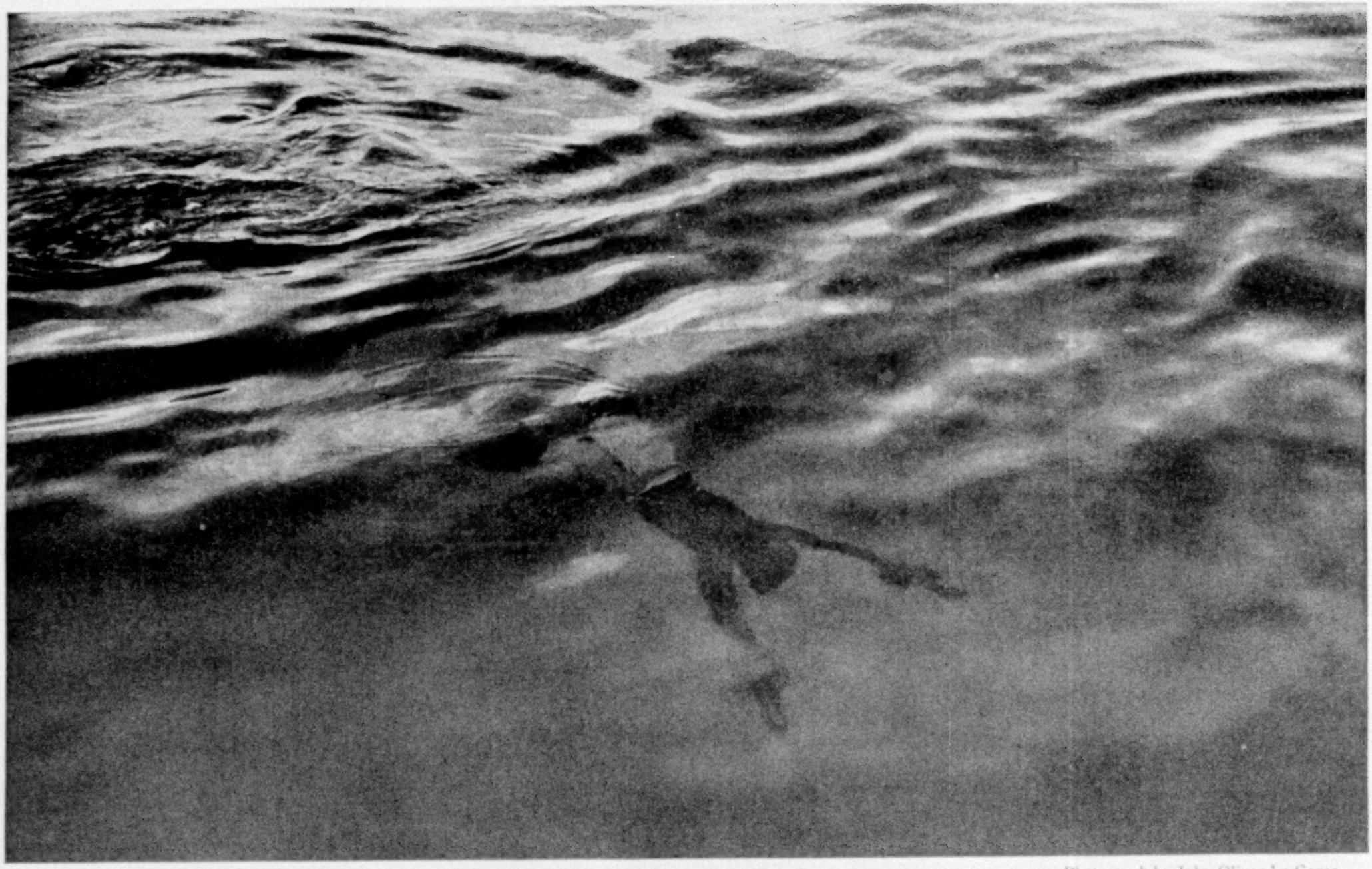
In a few years more Florida knows she will have to depend on second-growth forests, for the virgin growth will be gone. But she faces this fact thoughtfully and not in dismay. "Consequently," says the State Commissioner of Agriculture, "the most vital question before Florida, in relation to its major area, is reforestation, protection of timber lands, management and selective systems, so that all second growth may play its part in bringing back wealth to the State."

When one considers the number of golf players the ancient game has developed in the United States, then multiplies the total

Photograph from Hamilton M. Wright, Jr.

THE PONIES LINE UP FOR A START AT THE MIAMI JOCKEY CLUB

From the great tourist throng that crowds the grandstand and paddock, there can be no doubt as to the number of horse lovers that journey to the Southland during the winter season.



Photograph by John Oliver La Gorce

A BLACK "PEARL" DIVER

The sparkling waters of the Gulf Stream, which lave the southern Florida coast, are so clear that frequently the sea floor far below, richly carpeted with beautiful marine growths, in which queer fishes and other forms of sea life make their home, may be seen from the surface when unruffled by wind.

Photograph from Dr. J. Lawn Thompson

A DAY'S CATCH BY TWO NORTHERN SPORTSMEN

The giant jewfish, suspended above, is eight feet long and six feet four inches in girth. On the rack and lying on the dock are amber jack, dolphin, barracuda, grouper, kingfish, and mackerel. All but the barracuda are eatable and such catches are generally given to hospitals or hotels.

by perhaps ten, some idea of the army which swears by fishing as a hobby may be imagined and the lure of Florida's teeming waters for the followers of Izaak Walton pictured.

THE LURE OF THE SINGING LINE

Our Government experts may scientifically estimate the hidden supply of coal, ore, oil, and relative natural resources, but no one has the temerity to try to gauge the crop of the fish life of the Gulf Stream, except to prove that there are more than 600 known varieties and others being steadily added to the list. The warm waters off the East Coast and corresponding conditions in the Gulf of Mexico, on the western side, are perhaps unequaled the world around as Nature's own incubator of marine life.

Just offshore on either coast the piscatorial enthusiast finds his happy hunting ground. The sea is alive with such fighting tribesmen as tarpon, sailfish, marlin, albacore, tuna, barracuda, wahoo, amber jack, dolphin, grouper, and many others familiar to salt-water fishermen. On the coral barrier reefs, but five miles off the East Coast, extending from Miami Beach to Key West, endless varieties of smaller fishes abound, finding their food as well as a fair protection from natural enemies in the holes and crannies of the submerged coral ramparts. I have seen great schools of Spanish mackerel, kingfish, and the lowly mullet migrating up and down, serving their never-satisfied appetites, but always on the lookout for a thousand foes who lie in wait behind coral head and sea fern to strike.

In the shallow waters near and between the Florida Keys, as well as in adjacent bays and creeks, the fishing fan finds on sand flats the bonefish, that unexcelled gamester for his weight and size in all the salty seas, as well as scores of varieties of more gentle fish bedecked by Nature with all the hues and beauty of the color gamut. For example, the angel fishes, moonfishes, squirrel fish or soldato, porkfish, grunts, yellow tail, sergeant major, parrots, and last, but not least, the gentle

little sea horse, are yours for the taking.*

Indeed, as were the thundering herds of buffalo to our Western plains in olden times, so to-day are the countless millions of the finny citizens of Florida waters. Here one may fish with bent pin or great barbed hook of steel, depending upon what is sought. From an economic standpoint, the day will come when this unlimited treasure house of food will be really drawn upon by the American people. Up to to-day it has been barely touched, in spite of the tens of thousands of pounds of food fish taken thereabout and shipped north the year round.

© H. Armstrong Roberts

SEMINOLE INDIANS CURING AN ALLIGATOR SKIN

In and around the Everglades country there has grown up an active industry in the capture of reptiles and the sale of their tanned skins.

FLORIDA ALSO FISHES FOR PROFIT

At Key West you see boatloads of Spanish mackerel and kingfish brought in, to be barreled and iced and then away to your distant table.

From Pensacola fleets fish for grouper and red snapper as far away as the coast of Campeche, in the Gulf of Mexico, let us say, for purposes of location. At Pensacola you find skippers and deep-sea fishermen from the world's far places. I talked to an old-time sailmaker from Portugal. In rig and equipment the Pensacola "smacks" are sharp-modeled hookers of 60 tons or more, much like the fishing schooners of the Atlantic Banks. It was the few bold New London fishermen, venturing down Florida way in the late 1840's in their 20-ton codfishing sloops, who first "wet a line" in this Florida snapper trade. Now it is a brisk business.

A smack out four weeks will, if the biting is snappy, bring in 25,000 or 30,000 pounds of snapper. From Pensacola scores of carloads go north each season. Snapper fishing is best in winter, but boats go also in summer, in spite of the fact that a long calm and intense tropical heat may mean drifting till all ice on board melts; then there's nothing to do but tack for home—perhaps with no fish at all.

Standing on the magnificent Bridge of Lions at St. Augustine toward evening,

* See, also, "The Book of Fishes: Game Fishes, Food Fishes, Shellfish and Curious Citizens of American Ocean Shores, Lakes and Rivers," published by the National Geographic Society.

Photograph by Clifton Adams

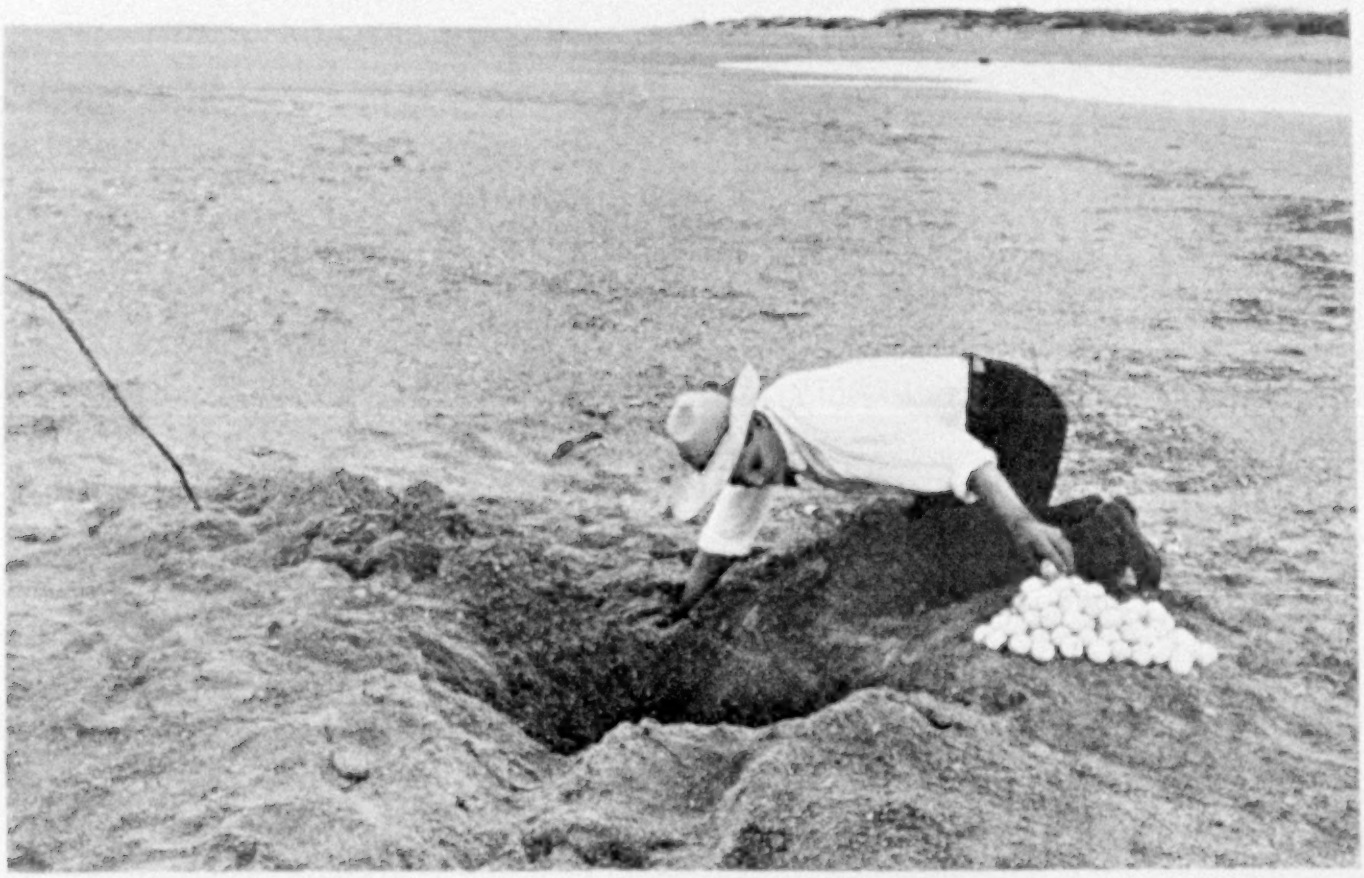
POMPANO FISHING ALONG THE ATLANTIC COAST OF FLORIDA

This type of angling requires both skill and brawn, for it takes strength and patience repeatedly to cast the weighted bait far out into the breakers.

© Publishers' Photo Service

TAMIAMI TRAIL

From the Atlantic to the Gulf of Mexico this splendid highway has been successfully thrust through the mysterious Everglades. The drainage canal that parallels the Trail is alive with small fish and frequently many feathered migrants charm the eye of the traveler.



Photograph by Florida Photographic Concern

DIGGING TURTLE EGGS

Hunters find a nest by following the turtle's tracks on the sea beaches. During certain seasons she lays her eggs in numbers, covering them with sand, where they hatch by the sun's heat.

Photograph by Clifton Adams

EPICUREAN FEASTS IN PROSPECT

While rather rough on the green turtle, the call for his services is loud and far-reaching. He and his brethren are given a more or less comfortable ride by fast steamer to northern markets, but then in good truth they end "in the soup."

KEY-WEST-BOUND OVER THE VIADUCT AT LONG KEY

No, they are not ship's passengers marooned by a pirate crew, but fishing fans, fresh from northern climes, watching their train depart for Key West before unpacking their tackle. Long Key is a world-known fishing camp.

UM

© Victor Dallin

KEY WEST, THE SOUTHERNMOST CITY IN THE UNITED STATES, LIES IN PRACTICALLY THE SAME LATITUDE AS BENARES, INDIA

With its sea-turtle and sponge fisheries, its ocean ferry to Havana, its large, colorful Cuban population, and splendid hotels, Key West is accessible by that magic railway which spans the Florida Keys.

ONCE THE HIDE-OUT OF "BLACK CÆSAR," A PIRATE OF BYGONE DAYS

This coral dot, called Cocolobo Key, is located 25 miles south of Miami. Once, legend says, it was the island lair of a pirate and wrecker who preyed on richly laden ships coming up from Central and South America. To-day it is used as a private club whose members are devoted to sport fishing. Besides all creature comforts, this unique club is equipped with glass-bottom boats for viewing the curious marine growths of the sea floor and it is connected with distant Miami Beach by wireless telephone.

Photographs by Richard B. Hoit

WHERE A MAGIC RAILWAY RUNS OUT TO SEA

Actually, it is built from key to key, tying Florida's mainland tip with far-away Key West; but the illusion is that it runs out into the ocean and disappears. An air view from Lower Matecumbe, looking southwest, to Long Key, four miles distant. These waters are fairly alive with tarpon and sailfish in their season.

Photograph by Clifton Adams

"WINGS OF FIRE"

A century or so ago the beautiful American flamingo was indigenous to southern Florida, for the fossil remains have been found. To-day, except for a stray now and then far down on the desert keys, the visitor is indeed a *rara avis*. After an exhaustive search among the countless islands of the Bahama group, a colony was discovered on Andros. The more numerous roseate spoonbill is frequently mistaken for the flamingo by amateur ornithologists. A small band of flamingos in captivity near Miami.

you see scores of odd-looking boats cruising in, followed by screaming gulls. Shaped like the fishing boats of Naples and manned often by swarthy men of Minorcan blood, this big fleet catches shrimp. Three hundred and seventeen loaded power boats came in the day I saw them and 90 more were due. Shrimp are taken elsewhere on the Florida coast—at Fernandina, for example—but the industry centers here. In season, an average of 12,000 bushels of dressed shrimp is shipped daily to points all over America.

At night the docks and packing houses and canning factories are ablaze with light. Then singing groups of colored women crowd the water front to earn 15 cents a bucketful cleaning the shellfish, which is done with amazing deftness and speed.

Government figures on Florida's fishing industry, including the heavy shipments from Lake Okeechobee, show upward of $23,000,000 annually and growing greater each year.

In sheer bulk, phosphate rock is Florida's major product. Geologists estimate

Photograph by John Oliver La Gorce

SOUTHERN FLORIDA WATERS HAVE DRAWN FISHERMEN FROM THE SEVEN SEAS

Greeks are here in quest of sponges, and among the mackerel, turtle, and snapper crews are found sailors, from Yankees and Portuguese to Austrians and Norwegians. A negro boatman from the Bahamas supplies a picturesque touch.

the reserve here at 290,000,000 tons. It is her chief source of mineral income. This product occurs either as rock or "land pebbles." Steam shovels mine the rock, but the pebble is recovered by hydraulic mining. Most of the rock is exported. At Tampa I saw a four-masted Belgian sailing vessel, a "school ship" training cadets for the Belgian merchant marine, unloading cement and taking on phosphate rock.

The pebble phosphate, carrying up to 77 per cent of tri-calcium phosphate, is largely sold to fertilizer factories. Of the 7,000,000 tons of commercial fertilizer used in America each year, more than half is phosphate.

Cement-making, canning, bakeries, factories for making beverages, clay products, fertilizers, mattresses, boats, furniture, ice, and, curiously enough, a printing and publishing business of more than $28,000,000 a year, are among the growing industries of Florida.

Great impetus has lately come to all local industries by the rise of a State-wide net of power-transmission lines. Commercial current is now supplied, from power houses which use oil as fuel, to practically every community in Florida. Though Florida is in no sense a manufacturing State, her shop output reaches $267,000,000 a year.

CITRUS GROVES NOW COVER 4,200 SQUARE MILES

Settlers brought the first orange seeds from Spain early in the 16th century, and, as the Indians liked the new fruit and as years passed, they planted scattering trees along the rivers and coasts. As more white colonists came, they set out more orange trees.

About 1700, tradition says, a roving English skipper, Shaddock by name, brought some strange South Sea citrus seeds to this part of the world. From this mere accident of pomelo plant migration came the shaddock's offshoot, the grapefruit, to develop so hugely in this plant laboratory of Florida. Unknown at first and hard to market, because its very name

Photograph by Dr. Paul Bartsch

ON THE SHORES OF LONELY BIRD KEY THOUSANDS OF WATERFOWL BREED

The wingsters who appear to be holding a convention on the ground, those of the black backs and white breasts, are sooty terns. The females lay their eggs on the sand without home-building. Nesting in the coconut palm are noddy terns, close relatives. Bird Key is one of the Dry Tortugas group far to the south.

was misleading, grapefruit now is eaten by increasing millions. Thus can man's food habits be changed by intelligent, if costly, advertising.

Of course, new industries grow slowly, and despite their centuries of existence, it was not till a few decades ago that Florida citrus groves reached a commercial basis To-day there are more than 22,000,000 trees in the State, of which 80 per cent are bearing. These orchards cover 4,200 square miles. The express companies say that tourists send to "the folks back home" nearly a million small gift boxes of fruit each season.

Since Indians and pioneer whites planted the first trees along the Indian River, the fruit belt has spread to the south. Frosts forced this, and now most groves lie along the East Coast, the middle West Coast, and along the central "ridge" from De Land to Arcadia. Riding north now from Panama City, in the higher, cooler regions of northwest Florida, you also see much new land being set to that hardy little Japanese orange, the Satsuma.

Last season the State picked 20,000,000 boxes of fruit as against 600,000 in 1884-1885. This shows how amazingly the rapid distribution of fresh fruit has grown in this country.

Roughly, one-third of all oranges eaten in America come from Florida; two-thirds are from California. They are exported in vast numbers to Canada, and a trade is growing with England, as indeed with all Europe.

So prodigious, so incredibly oceanic in its golden magnitude is this flood of fruit, that tens of thousands of yellow ice-cars are specially built to handle it, and a problem of the railroads is how to keep these long trains moving without glut or embargo.

From California a veritable deluge rushes over divergent lines that spread out east of the Mississippi like the ribs of a giant fan. At each rib end is a city, from which local dealers again distribute fruit to smaller towns round about.

From Florida, at the same time, a similar fruit flood flows north and northwest,

to meet and compete among 75,000,000 potential customers with fruit from the West.

How to put a 5-cent orange quickly into the hands of every man, woman, and child who has a nickel and wants an orange is the big market problem that the American orange grower has to solve—*every season.*

Faced with steady increase in output as additional young trees come into bearing, Florida growers turn now more and more to coöperatives, exchanges, and group effort—the State's really great problem that requires a superbrain to solve. Higher standards of grading and packing, prorating of sales and increasing consumer-demand through nation-wide advertising are among the aspects of the coöperative movement.

A NETWORK OF RAILS AND HIGHWAYS

It is like riding a bicycle across the Atlantic to go to Key West by rail across the famous Keys. Far below, one sees fisher boats and, perhaps out to sea, the black smoke plume of a battleship or a liner South America bound. As the locomotive moves over the long arches that leap from key to key, you get a vivid idea of the hard, dangerous work it took to sink those giant piers in that rushing tide and throw those tremendous spans across deep arms of the sea. One viaduct, the longest, exceeds seven miles.

Down over this seagoing railway tens of thousands pass every season en route to Havana.

It was the bold pioneering of imaginative railway builders, as when the Plant System pushed down to Tampa and the genius of Flagler drove the spectacular East Coast line down to Key West, that really opened up an uninhabited Florida to settlement. A crisscross of railways covers it now, and its 8,000 or more miles of good motor highways and more than 1,000 miles of inland waterways provide a system of communications unsurpassed anywhere. By using ferries, one may now motor all the way to Key West, and then ship one's car to Cuba.

Nor is Florida a laggard in the vision of air transportation, for the State boasts 34 airports in its cities and towns. As early as 1914-15 there was operated a flying ferry from St. Petersburg to Tampa. The United States mail flies every day from Atlanta, Georgia, to Miami, a daily passenger service links Miami to Havana, and from Miami to Nassau mechanical eagles fly triweekly. Miami is destined to be a great aërial depot for South American service that will surprise the Nation.

A COAST-TO-COAST HIGHWAY

Man's daring and genius in throwing an arrow-straight highway across the Everglades challenge imagination. The Tamiami Trail it was christened, a combination of the names Miami and Tampa, at either end. The commercial importance of such a giant causeway from the Atlantic to the Gulf is obvious; but few can visualize the Herculean task of building it. Often surveyors worked waist-deep in water; so did those who cleared the path of jungle growth. Then came the drillers, boring foot by foot down into the hard rock that lies like a stone-paved prairie below the watery surface of the Everglades. For 91 miles this path had to be drilled and blasted!

The amount of dynamite used was prodigious. Oxen, four to a cart, hauled the explosive in; but often rough spots were met, or deep water where oxen could not go. Then men shouldered the boxes of dynamite and floundered with them neck-deep in water and tangled vegetation.

Following the dynamiters came the giant dredges, throwing up piles of rock from the canal which the dredge itself dug. Then other dredges and steam shovels, leveling the big heaps of rock, till a good road was made and top-dressed. Here now is a rock road laid on a rock foundation, a highway that should, with a little intelligent upkeep, endure for thousands of years.

Riding over it now, you see thousands of birds resting or fishing. In the long, straight canal which parallels it myriads of small fish feed or play. Loitering tourists spear them and wild ducks chase them. One Chicago hunter, coming to shoot ducks, actually brought live decoys with him. Fixing a blind, he tied his decoys out and got ready to shoot. Then, to his dismay, his decoys began to "dive," one after another, and rose no more. 'Gators got 'em!

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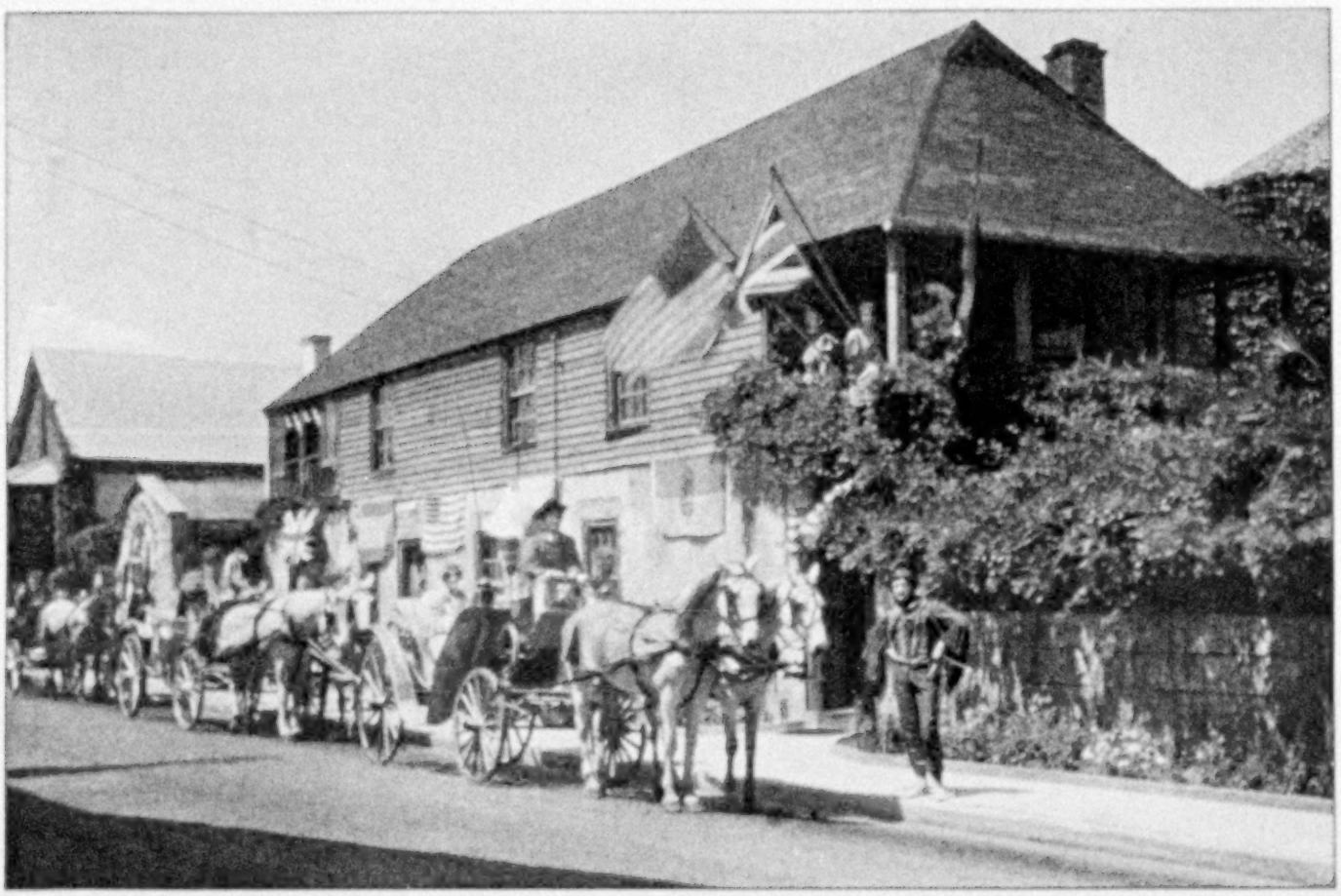
Autochrome by Clifton Adams

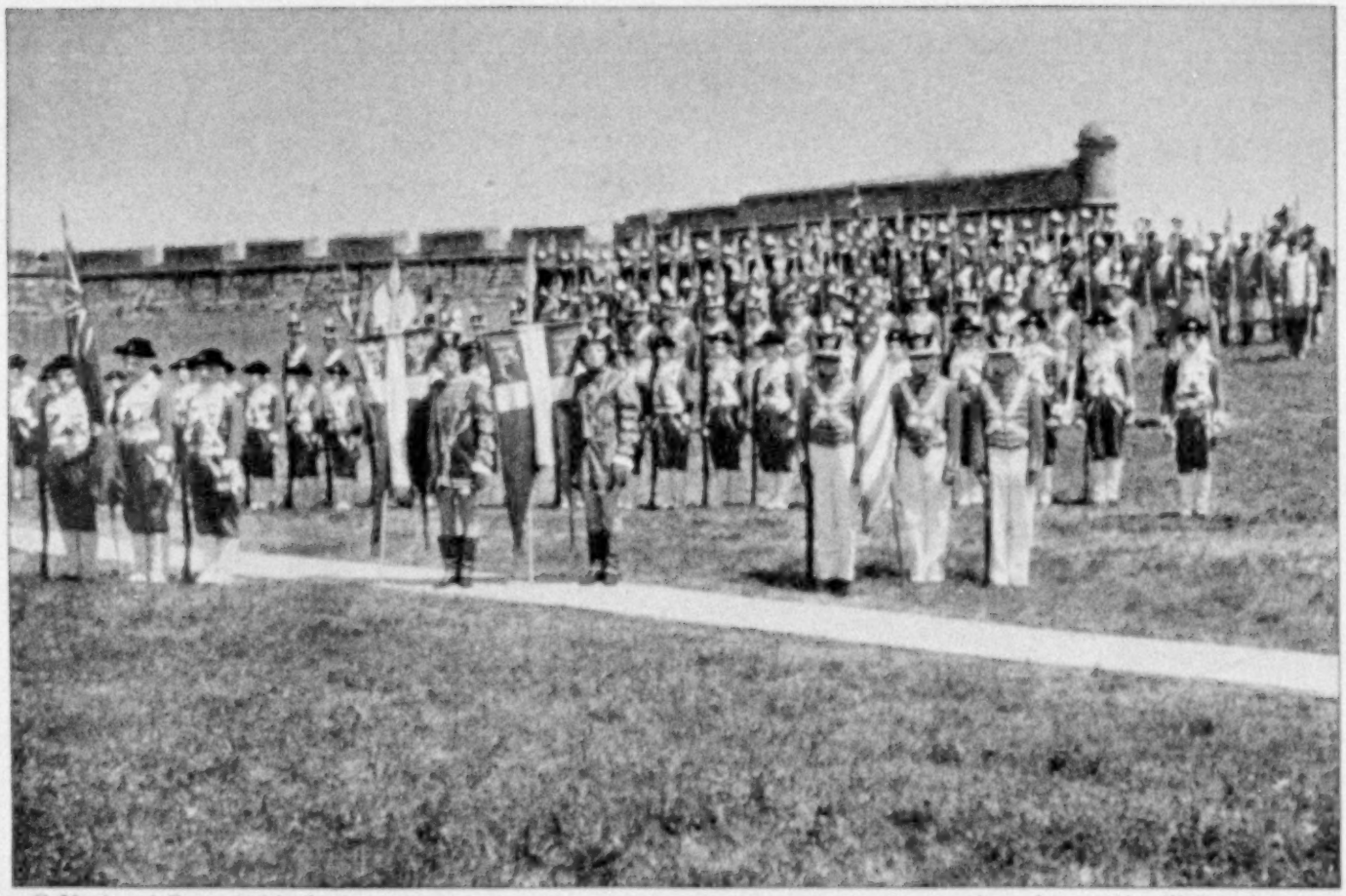
THE OLDEST CITY IN THE UNITED STATES BREATHES AN ATMOSPHERE OF SPANISH CAVALIER DAYS

St. Augustine dates its history from the latter half of the sixteenth century when the explorer and colonizer Pedro Menéndez de Aviles came adventuring and founded a city on the site of an Indian village. The flavor of the period of Spanish dominion is especially present at carnival time.



BANNERS OF THREE NATIONS WAVE FROM THIS VENERABLE STRUCTURE

The so-called "Oldest House" is the property of a St. Augustine historical society. The colors of Spain, Britain and the United States recall the fact that this city has lived under them all.



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CHANGING THE FLAGS AT ST. AUGUSTINE'S PONCE DE LEÓN CELEBRATION

Every few years the city stages a historical pageant commemorating the discovery of Florida by the gallant Spaniard. In the flag ceremony Indians, the original occupants of the State, and French, Spanish, English, and American soldiers, representative of later sovereignties, take part.

RELIVING SCENES FROM QUEEN ISABELLA'S COURT

Ladies in waiting to Her Majesty of Spain are recruited for the Ponce de León pageant at St. Augustine from neighboring cities of Florida and Georgia, as well as from the ranks of local society.

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MAIDS OF HONOR WEAR THE TRADITIONAL HIGH COMB AND LACE MANTILLA

Many of the ladies of St. Augustine can wear the costumes of Old Spain with peculiar grace, for their ancestors have in frequent instances lived there since the days of the early settlers from Castile and Aragon.

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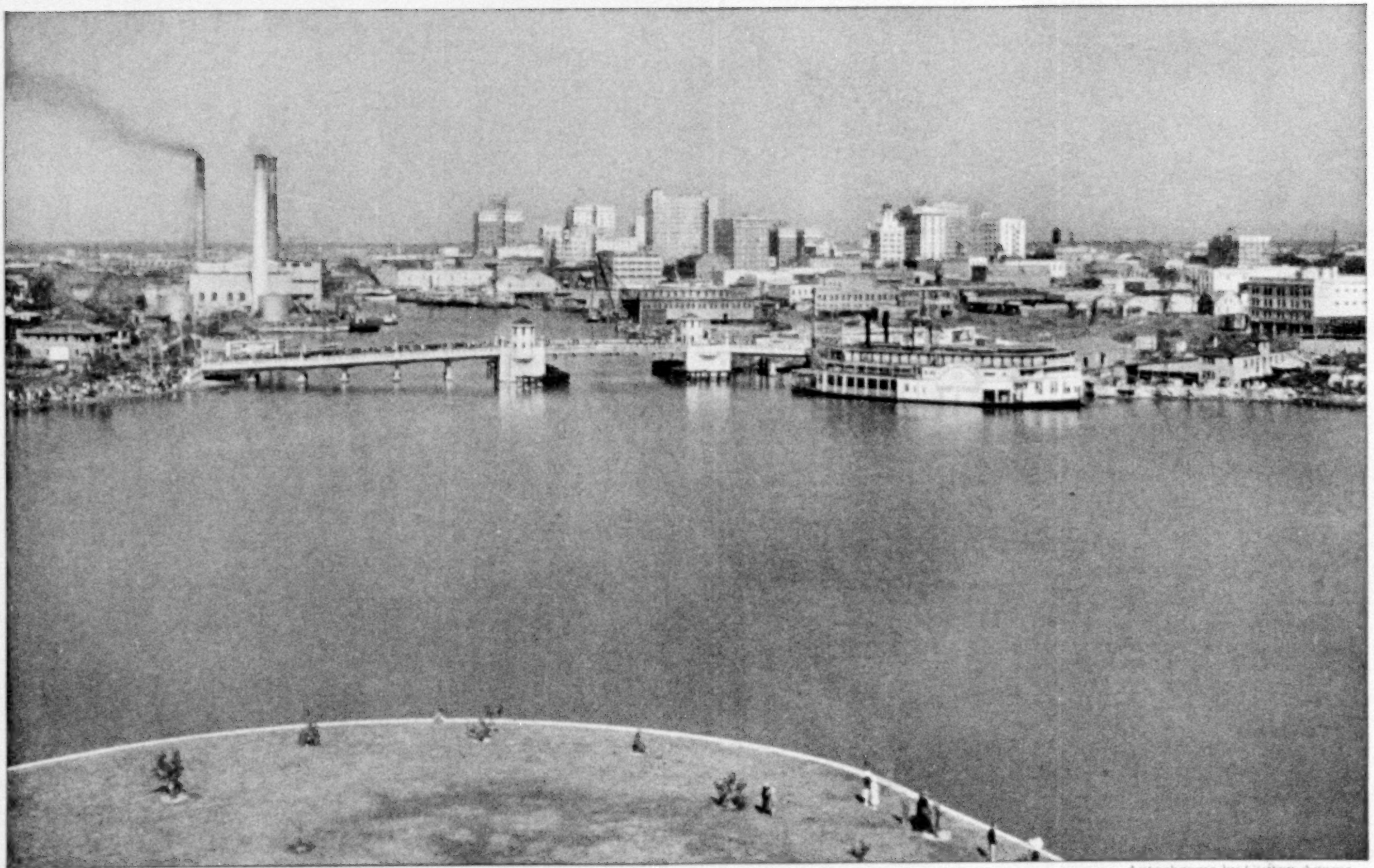
PAGEANTRY REFLECTS THE ROMANTIC PAST

These ladies are participants in Sarasota's celebration based on the appealing legend of Sara de Soto, beautiful daughter of Old Spain, and Chichi-Okobee, gallant prince of the Seminoles.



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TAMPA'S IMPRESSIVE WATERFRONT COMPARES FAVORABLY WITH ANY IN THE SOUTH

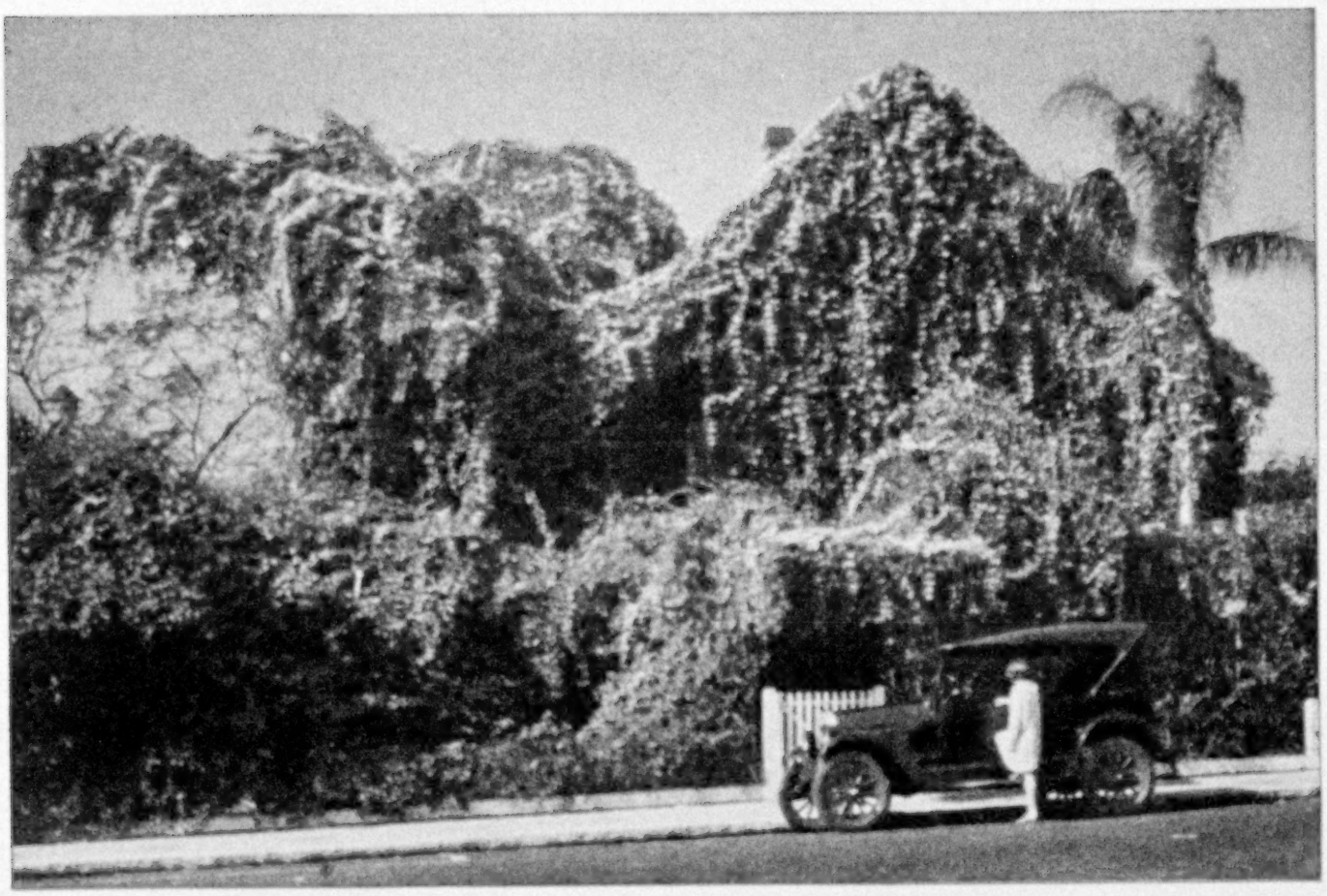
The enterprising city of to-day, throbbing with commercial activity and host to throngs of winter visitors, would hardly be recognized as the village which in 1898 thrilled as American volunteers sailed from this same harbor for service in Cuba. In the three decades which have intervened, Tampa has become a seaport of major importance and the cigar capital of the United States.

CARNIVAL DAYS KEEP FRESH THE MEMORY OF GASPARILLA

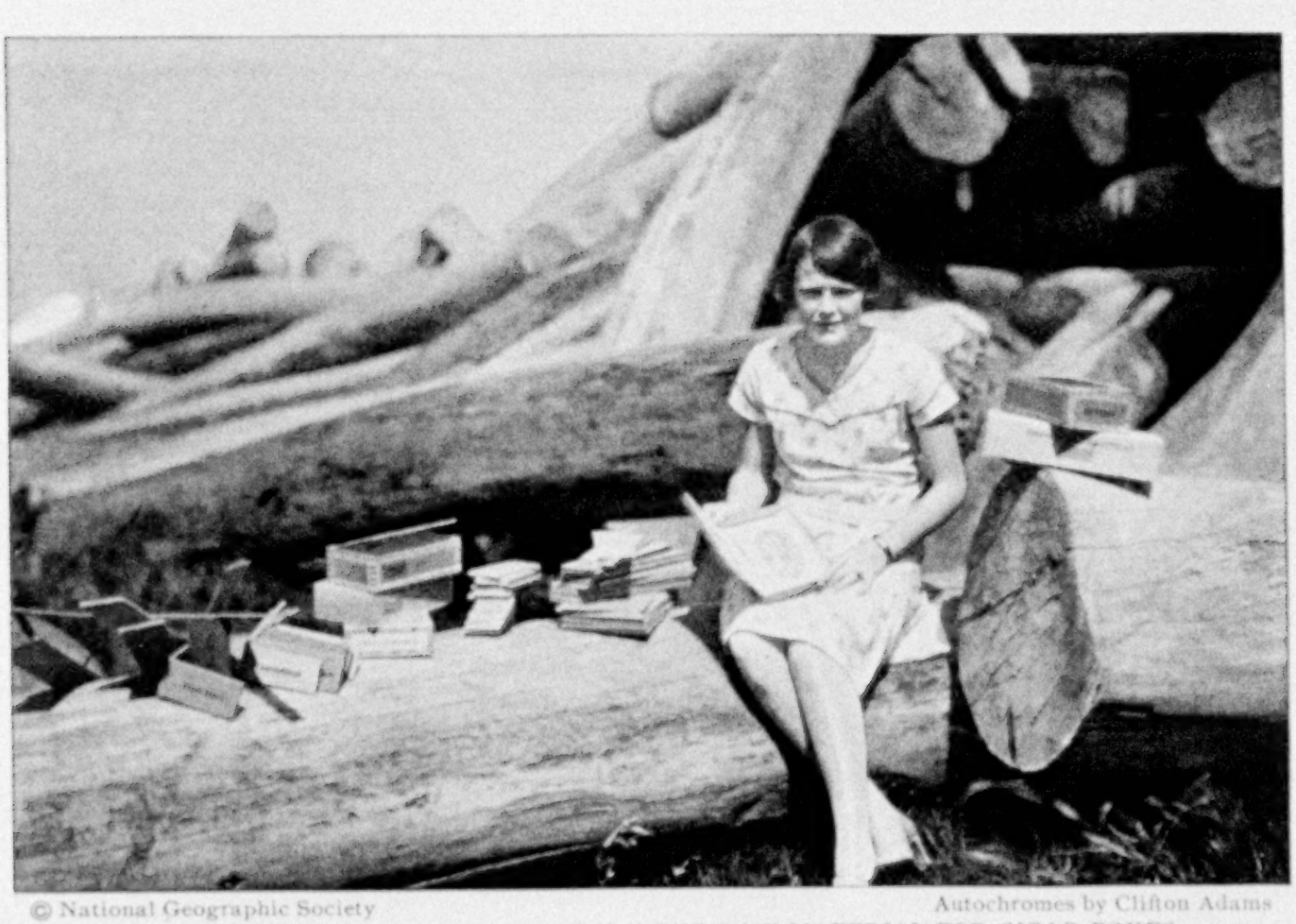
© National Geographic Society Autochromes by Clifton Adams

PIRATES ABOUT TO DESCEND ON TAMPA

An annual feature of the west coast winter season is the Gasparilla Carnival commemorating the deeds of that bold pirate. The fun makers sail up the bay in their colorful regalia and, after capturing the city, turn it over to the pursuit of merriment.



BIGNONIA VINES CONVERT A TARPON SPRINGS RESIDENCE INTO A BOWER OF BEAUTY



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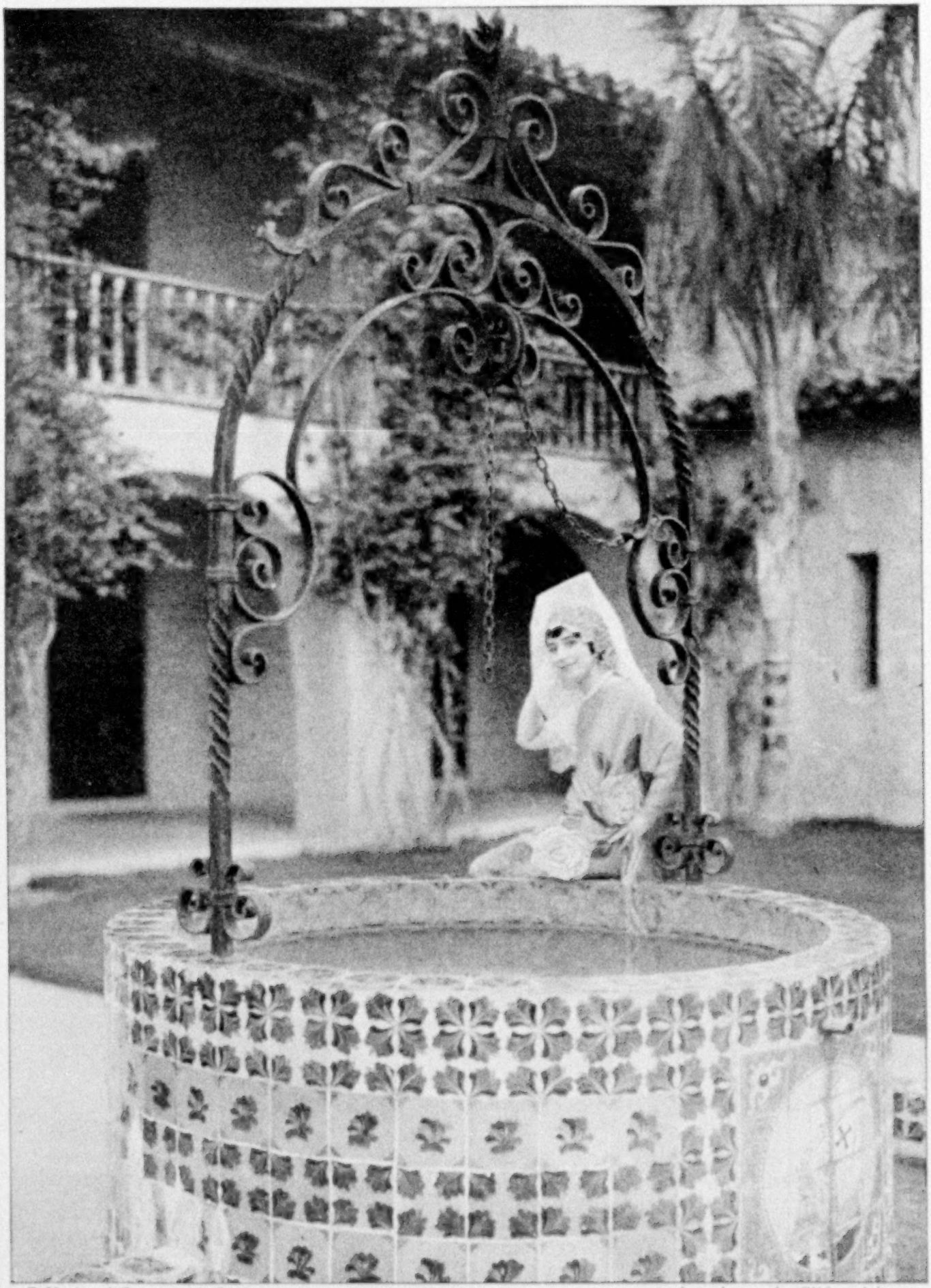
CENTRAL AMERICAN FORESTS SUPPLY THE RAW MATERIAL FOR CIGAR BOXES

Among Key West's principal industries are the manufacture of cigars and the making of boxes for packing. Factories transform giant cedar logs, shipped to the island city from Central America, into containers. Key West is the gateway to Cuba, just across the Straits of Florida.



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THE WISH AND THE WELL

As in the case of the Trevi fountain in Rome, legend avers that the departing guest who throws a coin into this well and accompanies the offering with a wish to return, will surely pass that way again. The servants probably benefit by the magic effect of the legend on visiting pocketbooks.

Whether you ride into Florida from Mobile over the Old Spanish Trail or come south through Georgia over the Dixie Highway, the same smooth, easy-riding pavement, often lined with graceful pines, sweeps onward into scenes of ever-changing beauty.

To ride down the ridge, as through Gainesville, Ocala, Orlando, and on to Winterhaven, Lakeland, Tampa, and Fort Myers, among lakes and orange groves, is to enjoy one of the scenic journeys of the world. Waving palm trees stand in the vast cabbage patches here just as they wave over the tobacco fields of Luzon.

One or more of the main highways reaches every port in the State. It is easy to see what this means to commerce, compared with parts of China, for example, where coolies still push wheelbarrows of freight a thousand miles to reach the sea. Here, as elsewhere, the truck and motor bus help boats and trains to handle traffic.

WHERE THE TRUCK IS KING

To collect and distribute fruit, lumber, and other freight, Florida now uses more than 40,000 trucks. Millions ride the busses, and in one year 1,230,000 cars are estimated to have crossed the Gandy Bridge over Tampa Bay. Out-of-State motor cars, going south or coming back, cross the great St. Johns River bridge at Jacksonville in a steady stream. During the rush season, cars from the North, spattered red with clay, have poured through Lake City for the resorts farther south at the rate of nearly two a minute during daylight hours.

To save time and distance for this ever-growing stream of motor vehicles, the State has built miles of handsome bridges. One of the most useful is the Victory Bridge over the Apalachicola River. Before it was built, that part of Florida to the west of it was seldom seen by travelers, except those who sported wings and tail feathers.

Florida has no bond issues to meet road costs. Aside from county and Federal aid, roads are paid for from a five-cent levy on gasoline and from taxes on motor cars.

Half-wild cattle snort and "high-tail it" back into the palmetto scrub when you ride suddenly upon them. Native cattle, "mostly hoofs, horns, and tails," as Texas cowboys say, roam by the scores of thousands over the vast open wood range of north and middle Florida. These small, underbred animals are descendants of cattle introduced long ago by Spaniards. As they tug and chew at some of the wild, tough plant life, one wonders how they masticate it without pain from spines and splinters.

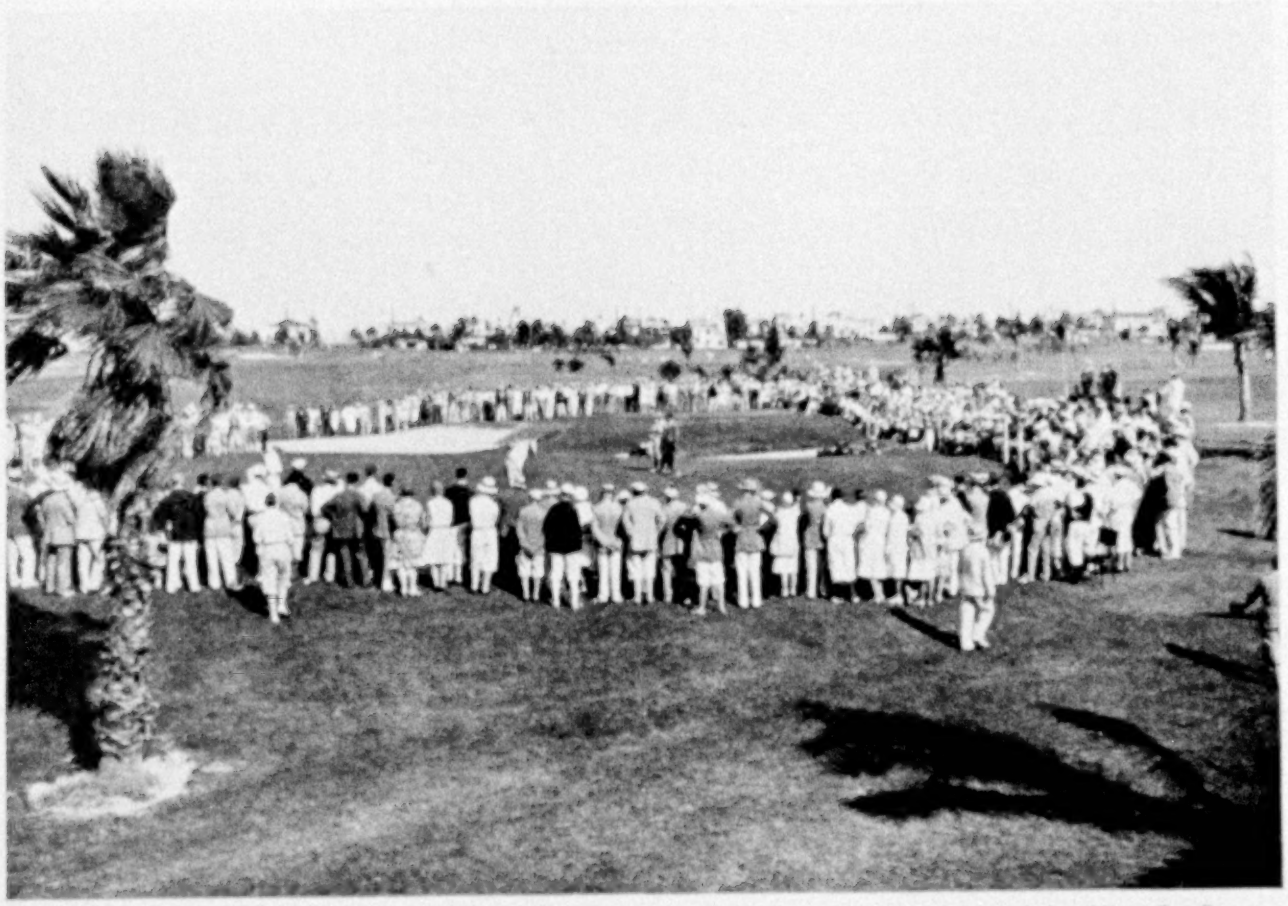
HOW FLORIDA IS BUILDING UP ITS CATTLE HERDS

Here the fever tick has long been the bane of bovine life. For decades this pest has militated against both the increase and the improvement of herds. To guard against it, Georgia built a double fence along her Florida line.

Now systematic tick eradication is under way. To date, nearly half the State has been made tick-free and strict quarantine is enforced against counties where the pest still prevails. This and the wide introduction of purebred bulls is slowly building up a better cattle industry. Florida hopes in time to supply at least her own beef, butter, and milk. Results from cross-breeding with the humpbacked, fever-resisting Brahman cattle about Brighton, north of Lake Okeechobee, and Aberdeen-Angus cattle in the Quincy region have been most satisfactory. This has likewise proved successful in the island of Jamaica and other of the English West Indies.

At a recent Liberty County fair the calves of native cows and other varieties of purebred sires were exhibited, weighing from 400 to 450 pounds at eight months of age. Aberdeen-Angus yearlings have been grown here which tipped the scales at 1,300 pounds and more.

Many herds already number 5,000 and upward. They are increasing steadily, as more and more counties are freed of ticks. Over much of Florida, cattle can graze from eight to ten months out of the year; and the best way to make vast areas of cut-over lands yield enough to pay taxes, Floridians say, is to run cattle on them. That program, as well as better fire and tick control, is now a fixed State policy. Also, to develop additional forage, various experiments are being made, as at the Gainesville station, with imported grasses, such as Napier, Bermuda, Guatemala, and others.



Photograph from John Oliver La Gorce

THE BATTLE GROUND FOR A PRIZE OF $15,000

That Florida is golf-minded may be sensed from the scores of splendid courses that spring up on every hand throughout the State and attract their daily thousands when the North is icebound. At Miami Beach one of the open championship events offers a cash prize of a small fortune to the winning professional and a great cup of silver and bronze to the lucky amateur.

In Texas—in our whole Southwest—Spanish occupation left its mark on speech and culture.

FROM FLORIDA SPAIN EXPLORED MUCH OF NORTH AMERICA

And, but for wars, the northern edge of Florida, instead of the Rio Grande, might now divide English-speaking North America from that part which talks Spanish.

But in Florida to-day, except for a few place names and such architectural monuments as the forts at St. Augustine and Pensacola, few traces of Spanish occupation survive.

Yet during three centuries, barring a few sanguinary lapses, this land was Spain's. From it as a base, as from Mexico, in the heyday of her glory, she explored much of North America. In all the annals of high adventure since the dawn of civilization, there is no narrative more breath-taking than that of Nuñez Cabeza de Vaca, who in seven years of peril and desperate deeds made his way from Florida to Culiacán, in western Mexico—the first white to traverse our continent. From here, too, De Soto set forth on that amazing march of discovery, only to leave his bones in the Father of Waters.

Yet in all the long, romantic list of admirals, governors, gentlemen adventurers, pirates, buccaneers, and wreckers whose names are enshrined in the amber of her history, Florida holds none above that of Ponce de León. All her school children know by rote the tale of his futile quest for youth eternal.

Legends, traditions, they linger on. In all long-settled communities their details are apt to improve with time. But in the excellent library of the historical society at St. Augustine and in a curiously complete private collection at Pensacola one finds crude early maps, time-stained documents, and rare books of travel in Florida dating back to ancient days of Spanish, French, and British occupation. Here is record, not legend. Thus historically, as well as economically, modern Florida comes to

Photograph by Carl G. Fisher

THIS MIGHT BE AFRICA RATHER THAN FLORIDA

"Skipper," then a three-year-old elephant, pet of a pioneer resident of Miami Beach, loved sea bathing like any normal baby and would play around this private pier, in the waters of the Gulf Stream, for hours daily.

know herself. Likewise, in the library of the State Historian at Tallahassee, there is being gathered fascinating data of incomparable reference value on early Florida.

Taking off from the Navy's Air Training Station at Pensacola, a visitor, seeing the South for the first time, was flown over the city and along its busy water front.

"What was that little park we flew over?" he asked his companion after landing.

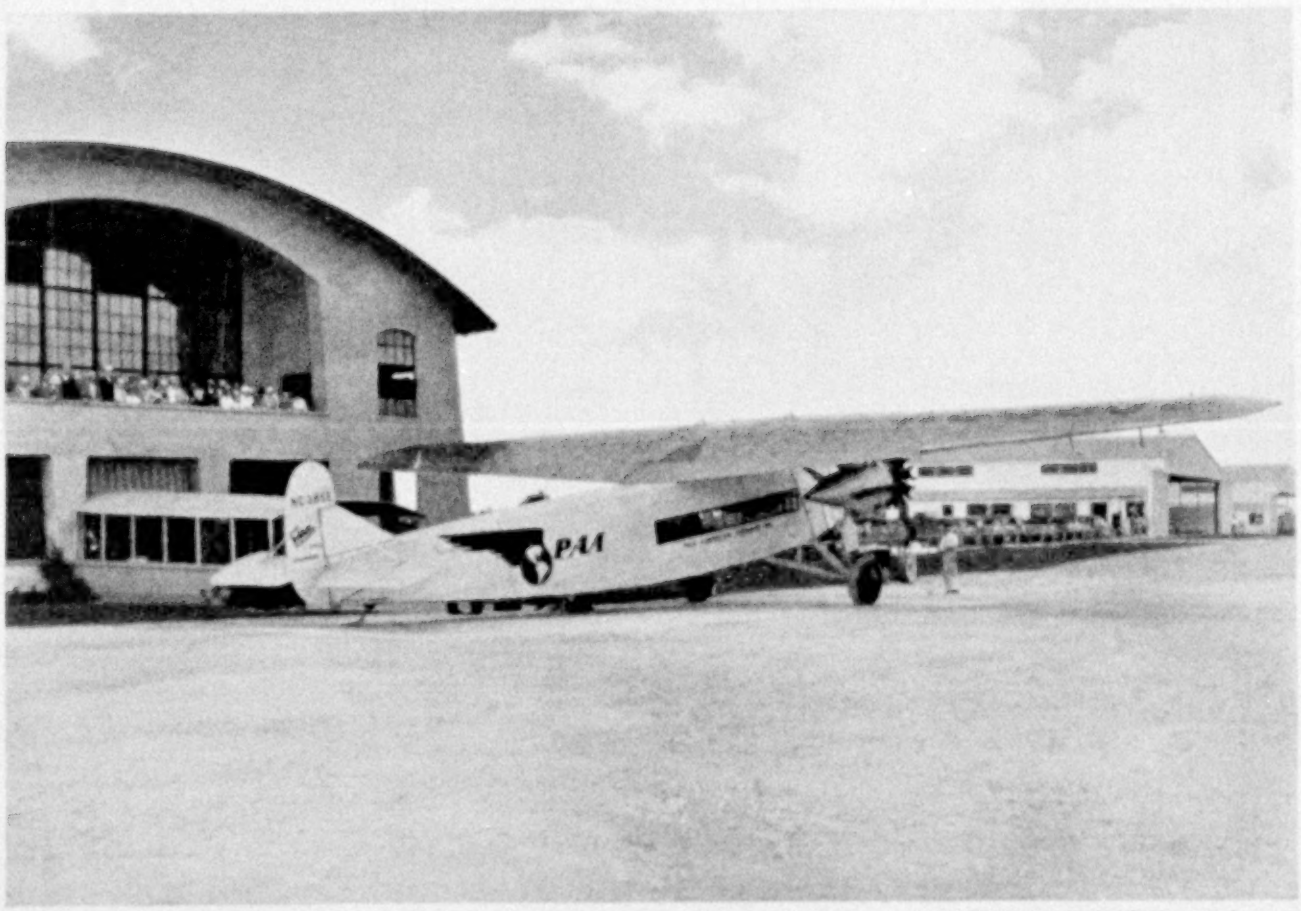
"That was formerly Plaza Ferdinand," said his pilot. "In 1821 the official act of ceding West Florida to the United States was staged there. And that was Fort Pickens, out there at the harbor entrance, the only Southern fort held by Northern forces during the Civil War. And the two old forts on the beach are Redoubt and San Carlos, built nearly 300 years ago. Boy, we make history fast in Pensacola! The Spaniards, the French, the English, all fought over our town and flew their flags here, till Andy Jackson ran up the Stars and Stripes in 1821. Just now we've got the biggest flying school in the United States Navy—200 planes here at once."

Enthusiasm! Sunlight spawns it in Florida!

"We burned to the ground in 1901," they told me in Jacksonville, or "Jax," as they shorten it. "But you can't keep a good town down. Now our union depot is the finest south of Washington; 112 passenger trains a day come in here, and they can handle 12,000 passengers. We're a leading lumber port of the South Atlantic coast. Twenty-five hundred ships a year tie us to the world's ocean trade and our bank clearings are a billion a year."

LEARNING TO SEE HERSELF

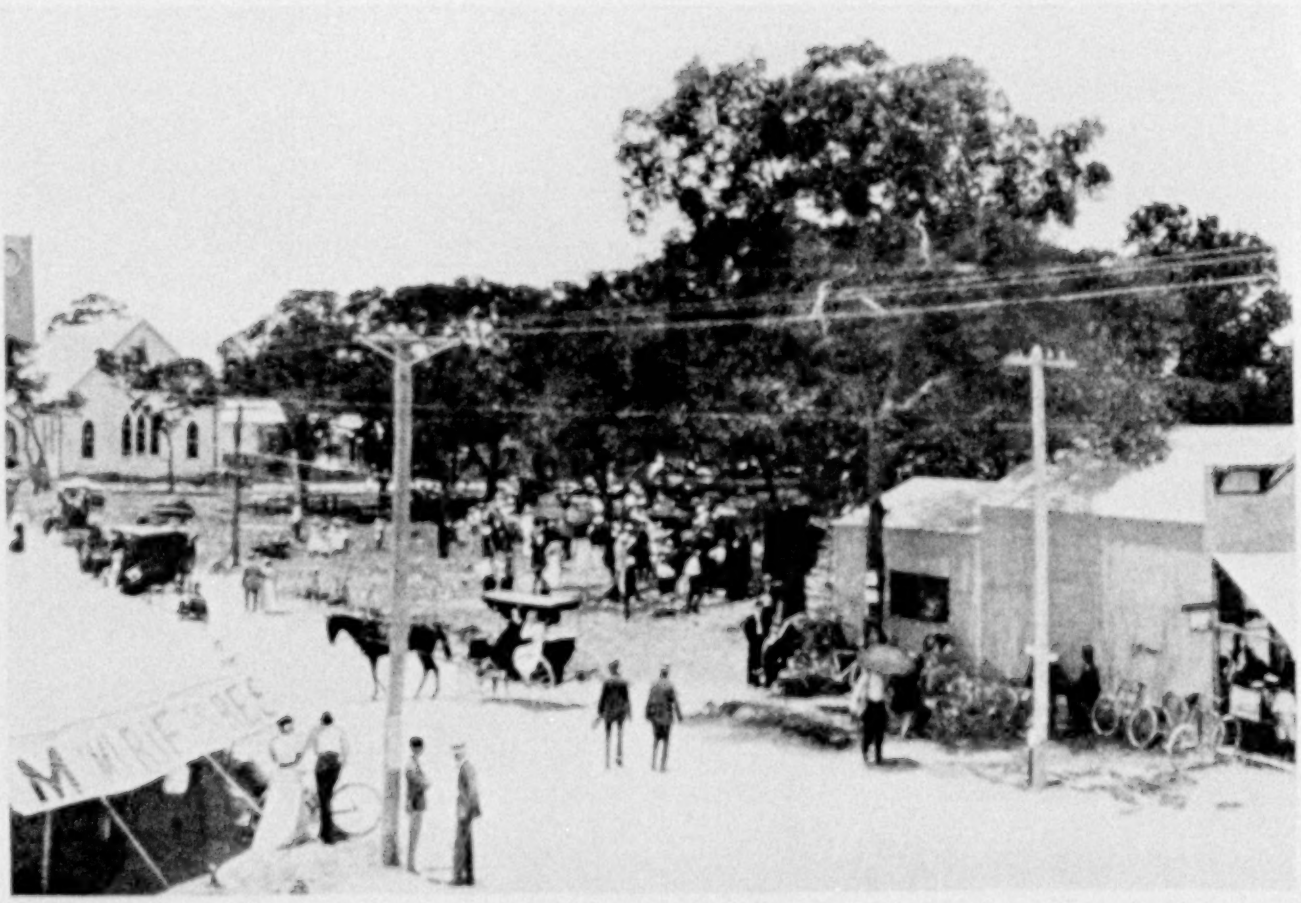
This gateway city is predominantly the industrial center of Florida. It counted for me 472 industries, making 483 different things. Figures are not dull if they reveal a condition. It is interesting, then, that more than half of Jacksonville's residents over ten years of age are gainfully employed, and 19,000 children have savings accounts. In working raw



Photograph by Clifton Adams

WHERE PASSENGERS TAKE THE AIR

This Miami airport is modern in every respect, with restaurant, customs, Public Health, Department of Agriculture, and other Government offices.



FEW WORLD CITIES GREW WITH MORE MAGIC SPEED THAN MIAMI

Indians camped where Miami now stands, and in the uprising of the early thirties whites built a fort here; but the railway, in 1896, made the city. Since 1920 its population has grown by 550 per cent. First Avenue and Flagler Street in 1888, as shown above, is indeed a far cry from the towering structures that one sees there to-day.

Photograph by Clifton Adams

OFTEN THE TRACKLESS HAUNT OF WILD CAT AND PANTHER

Taking its name from the Malay *manggimanggi*, the mangrove has the peculiar characteristic of germinating its countless seeds upon its own body, where they develop safely until ready to drop to earth and root. Rapidly spreading its twisted life over large areas of shallow tidal reaches, silt comes to rest among these roots and, lo, an islet is born!

materials up into finished products, its factories handle more than a third of all the State's output.

To think amid tourist hubbub, to see her own economic destiny through moving crowds, that now is real Florida's earnest aim.

Dog races, speed boats, the last word in beach pajamas, hectic nights in gilded casinos—they are aspects of fleeting tourist seasons.

But 1,411,000 settled people, who make their homes here the year around, look far beyond this year's cash from winter visitors. To-morrow a new generation will pick fruit, fish, manage the banks, and direct the air, land, and ocean lines; to-morrow 150,000 youths now in Florida schools and colleges will run the State—a bigger, busier State. Facing to-morrow, she seeks to improve her mind as well as her farms and cities. World culture once centered about the sunny Mediterranean. Here, also, by blue water and bright skies, man's imagination is released. Seats of learning dot the State.

She makes no effort, of course, to win students from older institutions, such as those in New England. Many come here for reasons of their own, but Florida's chief purpose in State aid to education is to prepare youth for happy, useful life *in Florida*.

To walk over the fascinating State Agricultural Experiment Station of the University at Gainesville is to see for yourself how useful its training is. Laid out in verdant, velvety squares, you see various grasses brought from far and near. By trial and error, in time the grasses are found which will grow best in this climate and serve best for lawns, golf greens, forage, and other uses.

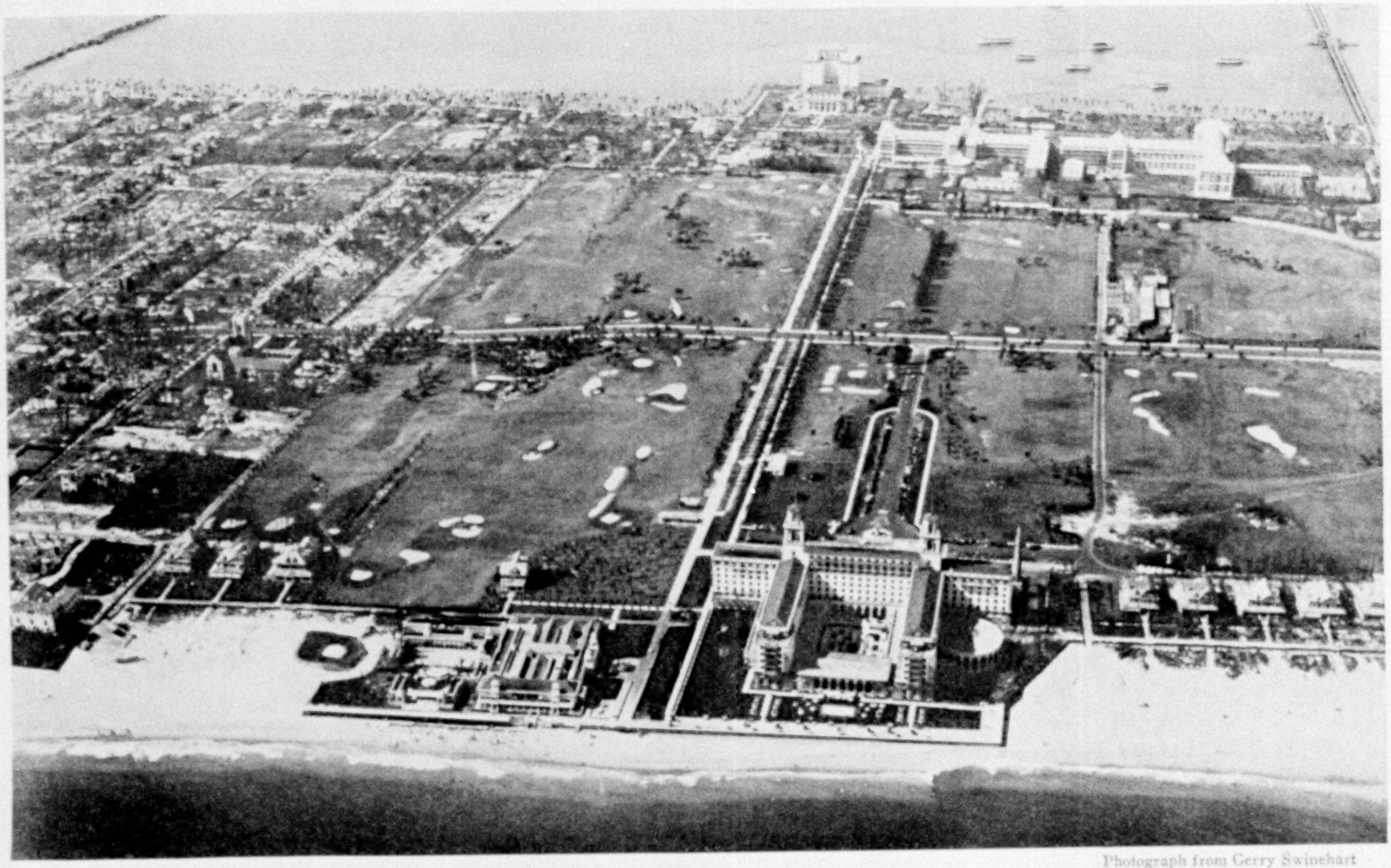
Bugs are a bane of Florida farmers. And 16 years ago the citrus canker appeared in fruit trees. The only way to combat it was to *inspect every tree in the State* and burn those affected. This was done.

Little does the average person enjoying fresh fruit and early vegetables realize the constant battle against insect pests, low

Photograph from Gerry Swinehart

GRACEFUL COCONUT TREES HINT AT FLORIDA'S KINSHIP WITH THE TROPICS

West Palm Beach, rising boldly beside Lake Worth—dotted by private yachts and sumptuous houseboats of winter visitors—reveals to travelers' tired eyes a scene of charm and tranquillity.



Photograph from Gerry Swinehart

A SECTION OF PALM BEACH AS WILD GEESE AND PASSING AIRMEN SEE IT

In the foreground the warm Atlantic surf beats at the feet of a famous hotel and a near-by bathing casino. Stretching behind the hotel is a splendid golf course. In the background shines Lake Worth and other mammoth hotels. Many luxurious private homes stand along the ocean drives north and south of the beach hotels.

Photograph by Richard B. Hoit

SIGHT-SEEING SEAPLANES, SHUTTLING UP AND DOWN MIAMI'S WATER FRONT, REVEAL HER UPTHRUSTING SKYLINE, WHILE ON THE WESTERN HORIZON BROOD THE MYSTERIOUS EVERGLADES

XUM

Photograph by Richard B. Hoit

INGENIOUS DREDGING AND BREAKWATER BUILDING HAVE TURNED FORMER SHOALS INTO A COMMODIOUS HARBOR

Ocean liners entering Biscayne Bay through the Government cut dredged by Army engineers. On the right is the southernmost tip of Miami Beach; beyond, one of the spacious causeways connecting it with Miami and flanked by Star and Palm Islands, both man-made and charming. Miami itself is plainly seen in the distance.

Photograph from Gerry Swinehart

SHELTERING PALMS SEEM TO SPELL RELAXATION AND HAPPINESS

There is a rare charm in the very atmosphere of out-of-door "Coconut Grove" at Palm Beach. Here are to be found many of the socially great and near great of both the United States and Europe during the winter season.

temperatures, and glutted markets that are the lot of those who grow and distribute. These farmers are real friends of mankind, and their splendid spirit and determination in the face of Nature's unkindest blows are both brave and fine.

To fight fruit pests, the experimental farm works hand in hand with Federal and State plant boards. Every ship docking at a Florida port and every airplane arriving from overseas is now thoroughly inspected. "Over half of all destructive insect pests we have were introduced from foreign lands," an official told me, and he gave me a queer little map showing the peninsula of Florida with bugs and worms seeking to enter by train, steamship, and airplane from every direction. Each bug carried a handbag, showing he meant to stay.

Fruits, flowers, nuts, and forest trees, vegetables, domestic animals, poultry—every factor in farming—are studied in this laboratory, and the lessons learned are applied to building up a better country life in Florida.

A great area of south Florida has recently suffered a heavy blow to honest labor, invested capital, and economic need by a visitation of the Mediterranean fruit fly that had to be fought with what amounted to wholesale destruction of valuable prop-

Photograph by Acme

ONE OF A GREAT FLEET

Screaming gulls and clownish pelicans escort Florida shrimp trawlers into port. St. Augustine and Fernandina are centers of the shrimp industry.

erty. Both Federal and State officials rallied their forces to battle the invasion and the best American scientific brains were brought forward to help solve the ruinous problem. Once again the fine spirit of the Florida people was demonstrated.

At Tallahassee there is the Florida State College for Women and industrial schools at Marianna and Ocala. Of private schools, there is Rollins College at Winter Park, Southern College at Lakeland, and the John B. Stetson University at De Land.

Pointing like a long wharf far down at the Equator and tied as she is by air and water lines with Latin America, Florida's commercial destiny is linked with the Tropics. It is only natural, then, that in the new University of Miami many courses should cover Pan-American subjects. Here a large percentage of students are studying Spanish, and to promote mutual understanding of international affairs, instructors from Latin America seats of learning are found on the Miami faculty.

Oh, yes, about the great wind. True, Florida has experienced two devastating visitations of Providence in the past few years that brought the citizens of southern portions of the State to their physical knees and took a heavy toll of life and property. Prior to 1926, however, no storms of such terrific magnitude had been recorded thereabout for a quarter of a century.

TRUE AMERICAN COURAGE

Our Nation can point with pride to the unexcelled courage and the dauntless spirit of Florida's people, who, though stricken, were unbowed by misfortune and, rising up, marched on to rebuild and rebeautify. In their gallant hearts and with the help of their countrymen, they "came back." They were not unmindful of the acts of God, over which mere man has no control, that came to their friendly rival, California, across the continent; of the tragedy of the Mississippi; of deluged New England; of Chicago's and Baltimore's fire, and of the winds that have swept Kansas; they "carried on," and to victory, like true Americans.

Yes, Floridians have won their place in the sun.

87 86 85 84

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30

ALABAMA

Atmore Flomaton Brewton Florala Geneva Samson Colquitt Pelham Moultrie

Century Bluff Springs McDavid Munson Walnut Hill Jay Laurel Hill Blackman Paxton Molino Campellton Malone Basinet Greenwood Baunbridge Whigham Cairo Thomasville

ESCAMBIA SANTA ROSA Milton Bagdad OKALOOSA WALTON HOLMES Bonifay JACKSON Marianna Chipley WASHINGTON Vernon Caryville Compass Lake Campbellton Deerwood Grand Ridge Sneads Gretna Quincy Tallahassee GADSDEN LEON

Pensacola Warrington Gulf Breeze Navarre Beach Santa Rosa Island Milton Pace Floridatown Bagdad Muscogee Cottage Hill Cantonment Gonzalez Perdido Allen Mason Lillian Wellburn Robertsdale Ensley Escambia Olive Mulat Brent Pensacola East Bay Garcon Point Holley Pensacola Bay Marine Navy Air Station Santa Rosa Sound Santa Rosa Island Gulf Beach Ft Barrancas GULF OF MEXICO

Fountain Clarksville Blountstown Bristol Telogia Youngstown Scotts Ferry Wewahitchka Newt Crawfordville Panama City Bay Harbor Panama City Beach Andrews Andrews Lake Millville St Andrews Bay Auburn Fanlew St Marks Medway Tallahassee Mortice Cody Capps Woodville Lake Jackson Chaires Capitola Miccosukee Monticello Jefferson Aucilla Lamont Waukulla Newport Carrabelle Lighthouse Point Apalachee Bay St Joseph Point Port Saint Joe St Joseph Bay Dog Island St George Sound Apalachicola Cape San Blas Apalachicola Bay St George Island Cape St George Dead

Jacksonville Atlantic Beach Florida Beach Jacksonville Beach South Jacksonville Arlington Dinsmore Fruit Eastport Cedar Point Mayport Cambon Marietta Mc Girts Cr Ortega Yukon Lamo San Jose Dewey Mineral City Nesbit Palm Valley Orange Park St Johns River Loretto Greenland Mandarin Bayard Peoria Pine Bluff Pinehurst Durbin Black Cr Middleburg Russell Switzerland Kilden Orangedale Sampson Green Cove Springs Millcreek Wallhill Shands Belmore Nicolata St Augustine New Augustine Vilano Beach Anastasia ATLANTIC OCEAN

Tarpon Springs St Joseph Sound Lake Fern Lake Butler Citrus Park Hillsborough River Safety Harbor Oak Manor Limona Caladesi Island Big Pass Little Pass Dunedin Tampa Clearwater Old Tampa Bay Sand Key Largo Indian Rocks Pinellas Park Rivera Gardenville Gadsden Pt Hillsboro Bay Pasadena St Petersburg St Petersburg Beach Long Key Passagrille Gulf City Ruskin Tampa Bay Little Sun City Manatee Willow Mullet Key Fort De Soto Terra Ceia Bradenton Manatee Palmetto GULF OF MEXICO

Monet Carman Kenney City Lake Worth Inlet Riviera West Palm Beach Northwood Palm Beach West Palm Beach Canal South Palm Beach Loxahatchee Southboro Lake Worth Greenacres City Lantana Hypoluxo Boynton Delray Hillsborough Canal Yamato Boca Raton Deerfield Hillsborough Inlet Pompano North New River Canal Floranada Lauderdale Ft Lauderdale New River Inlet South New River Canal Lake View Dania Hollywood Hallandale Miami Canal Uleta Opa Locka Biscayne Lemon City Little River Buena Vista Miami Beach Miami Panama Canal Allapattah Coconut Grove Tamiami Trail River Bluff Virginia Key Key Biscayne Cape Florida South Miami Kendall Hammock Keys Avenida Perrine Bay Safety Valve Soldier Key Fowey Rocks Entrance ATLANTIC OCEAN

FLORIDA

Compiled and Drawn in the Cartographic Section of the

NATIONAL GEOGRAPHIC SOCIETY

for the

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, LL.D., Litt. D.
EDITOR

Scale 1 : 2,700,000
or 42.61 miles to 1 inch

STATUTE MILES

KILOMETERS

- Capital
- County seats
- Cities and towns
- Through railroads
- Connecting railroads
- Highways
- Canals
- Swamps

83 82 81 80

31 30 29 28 27 26 25

Waycross Brunswick Hoboken Adel Nahunta Homerville Hopkins Valdosta Statenville Quitman Folkston St Marys Kings Ferry Nassau Fernandina Callahan Jasper Jennings Madison Hamilton Suwannee Lake City Live Oak Perry Taylor Lafayette Mayo Branford Carbur Hugh Spgs. Starke Baldwin Jacksonville Atlantic Beach Jacksonville Beach Eastport Maport Bradford Clay Green Cove Springs St Augustine St Augustine Inlet New Augustine St Johns Alachua Putnam Palatka Gainesville Hastings Palatka Dixie Cross City Otter Creek Sumter Levy Marion Ocala Dunnellon Cedar Keys Waccasassa Bay Citrus Inverness Floral City Brooksville Hernando Pasco New Port Richey Tarpon Springs Dade City Zephyrhills Lakeland Tampa Dunedin Clearwater Hillsborough St Petersburg Gulfport Pinellas Fort Meade Polk Winter Haven Lakeland Auburndale Lake Wales Bartow Osceola Kissimmee Orlando Winter Park Melbourne Tillusville Cocoa Indian River Vero Beach Fort Pierce St Lucie Indian River Inlet St Lucie Inlet Manatee Bradenton Palmetto Sarasota Sarasota Bay Sarasota Key Arcadia Desoto Hardee Wauchula Zolfo Springs Avon Park Sebring Highlands Okeechobee Lake Okeechobee Martin Stuart Jupiter Jupiter Inlet Glades Venice Murdock Englewood Punta Gorda Charlotte Charlotte Harbor Boca Grande Cayo Costa Pine Island Sound Captive I. Sanibel I. Fort Myers Lee Hendry Okaloacoochee Slough Immokalee Big Cypress Swamp Naples Collier Deep Lake Collier City Cape Romano Ten Thousand Islands Everglades Tamiami Trail Palm Beach West Palm Beach Greenacres City Lake Worth Boynton Delray Boca Raton Deerfield Pompano Beach Hillsborough Inlet Broward Fort Lauderdale Dania Hollywood Hallandale Miami Beach Miami Coconut Grove Perrine Homestead Florida City Redland Biscayne Bay Card Sound Key Largo Biscayne Sound Porcupine Bay Ponce de Leon Bay Northeast Cape East Cape Rock Harbor Florida Bay Ormond Seabreeze Daytona Beach Port Orange Mission City De Land New Smyrna Mosquito Lagoon Volusia Flagler Seminole Orange Counter Current Gulf Stream False Cape Merritt Island Cape Canaveral Mexico Gulf of

Tallahassee
Panama City
Apalachee Bay
Apalachicola
Cape San Blas
Cape St George
Port St Joe
St Joseph Bay
St George Sound
Dog Island
Lighthouse Point
St Josephs Point
GULF
FRANKLIN

ALABAMA
Pensacola
Pensacola Bay
East Bay
Santa Rosa Sound
Santa Rosa Island
Milton
Bagdad
Gulf Beach
GULF OF MEXICO

Jacksonville
Atlantic Beach
Florida Beach
Jacksonville Beach
South Jacksonville
Mineral City
Palm Valley
Green Cove Springs
St Augustine
New Augustine
ATLANTIC OCEAN

West Palm Beach
Palm Beach
Lake Worth
Greenacres City
Boynton
Delray
Pompano
Floranada
Ft Lauderdale
Hollywood
Miami
Miami Beach
Coconut Grove
Perrine
Homestead
Florida City
Key Biscayne
Virginia Key
Cape Florida
Biscayne Bay
ATLANTIC OCEAN

Tampa
Tampa Bay
Old Tampa Bay
Hillsboro Bay
Clearwater
Dunedin
St Petersburg
Gulfport
Tarpon Springs
Palmetto
Bradenton
Manatee
Sarasota
Anna Maria
Long Key
Passagrille
Indian Rocks
Sand Key
Big Pass
Little Pass
Caladesi Island
Anna Maria Key
New Pass
GULF OF MEXICO

Scale of all insets 15 miles to 1 inch

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NATIONAL GEOGRAPHIC MAGAZINE

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STATUTE MILES
KILOMETERS

Capital
County seats
Cities and towns
Through railroads
Connecting railroads
Highways
Canals
Swamps

Jacksonville
Jacksonville Beach
St Augustine
Ormond
Seabreeze
Daytona Beach
New Smyrna
De Land
Ocala
Dunnellon
Inverness
Brooksville
Dade City
Zephyrhills
New Port Richey
Tarpon Springs
Lakeland
Tampa
Dunedin
Clearwater
St Petersburg
Fort Meade
Winter Park
Orlando
Titusville
Cape Canaveral
False Cape
Melbourne
Vero Beach
Indian River Inlet
Ft Pierce
St Lucie Inlet
Okeechobee
Stuart
Lake Okeechobee
Palm Beach
West Palm Beach
Lake Worth
Greenacres City
Delray
Boynton
Deerfield
Pompano
Hillsborough Inlet
Ft Lauderdale
Dania
Hollywood
Miami Beach
Miami
Coconut Grove
Perrine
Homestead
Florida City
Biscayne Bay
Key Largo
Rock Harbor
Key West
Marquesas Keys
Dry Tortugas
Fort Myers
Punta Gorda
Charlotte Harbor
Naples
Big Cypress Swamp
Everglades
Cape Romano
Ten Thousand Islands
Pine Islands
Marathon
Saddle Bunch Keys
Northwest Cape
East Cape
Ponce de Leon Bay
Florida Bay
Gulf of Mexico
Straits of Florida
Counter Current
Gulf Stream
Atlantic Ocean

ALACHUA
BAKER
BRADFORD
CLAY
COLUMBIA
DIXIE
DUVAL
FLAGLER
GILCHRIST
HAMILTON
HARDEE
HENDRY
HERNANDO
HIGHLANDS
HILLSBOROUGH
LAFAYETTE
LAKE
LEE
LEVY
MANATEE
MARION
MARTIN
MONROE
NASSAU
OKEECHOBEE
ORANGE
OSCEOLA
PALM BEACH
PASCO
PINELLAS
POLK
PUTNAM
SARASOTA
SEMINOLE
ST JOHNS
ST LUCIE
SUMTER
SUWANNEE
TAYLOR
UNION
VOLUSIA
WAKULLA
WALTON

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83 LONGITUDE WEST 82 OF GREENWICH 81 80

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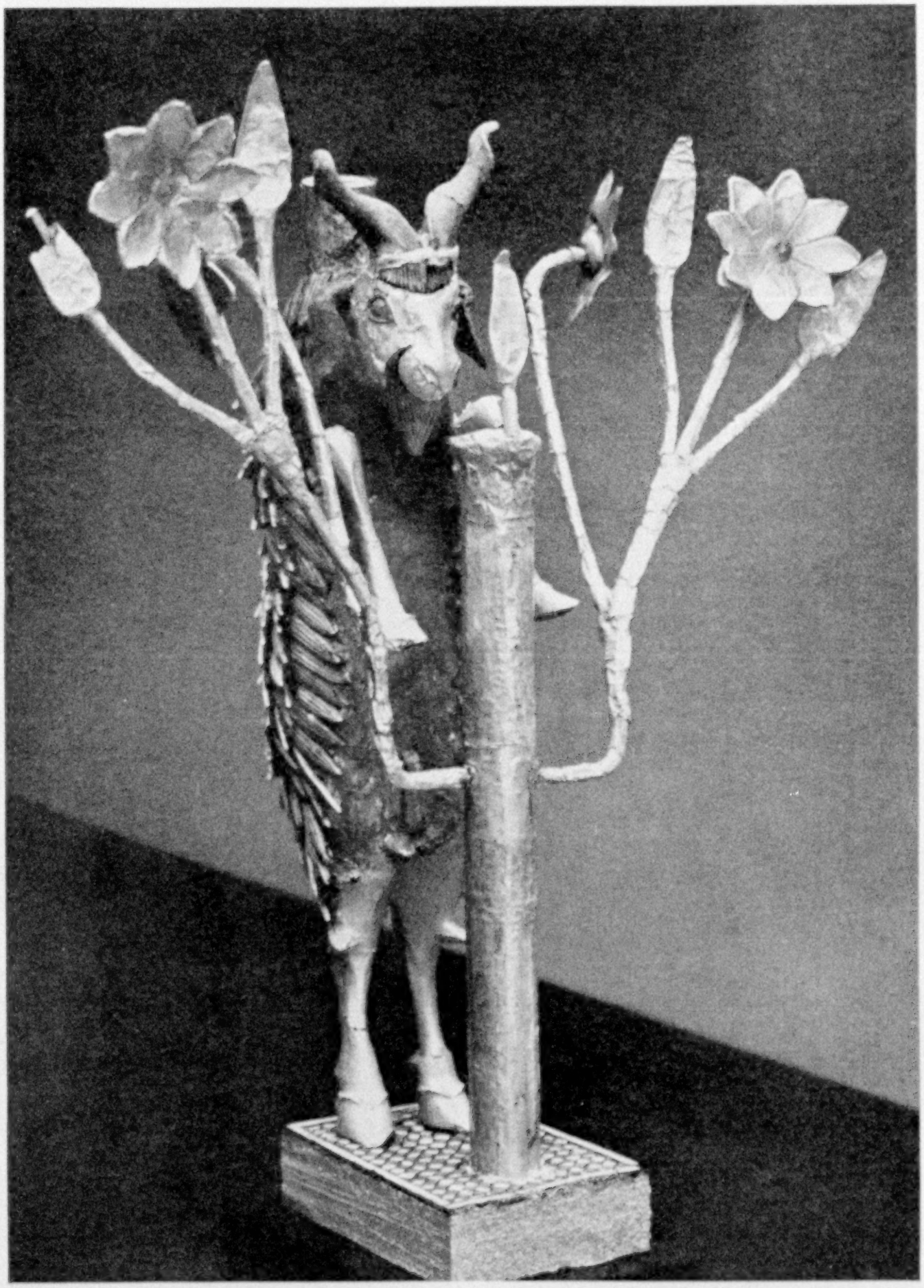


UR'S RAMPANT RAM RECALLS ABRAHAM'S SACRIFICE

One of a pair of figures found in a grave in the ancient city of Abraham (see text, page 128). The body consists of a wooden core overlaid with a fleece of shell; the mane, beard, and horns are of lapis lazuli, the head and legs of gold. For the first time, this heraldic symbol has emerged in the round and is reminiscent of the ram caught in a thicket, vouchsafed by God to Abraham as a substitute sacrifice for Isaac (Genesis XXII, 1-14).

NEW LIGHT ON ANCIENT UR

Excavations at the Site of the City of Abraham Reveal Geographical Evidence of the Biblical Story of the Flood

By M. E. L. Mallowan

With Illustrations from Photographs through the Courtesy of the British Museum and the Museum of the University of Pennsylvania

IN SPITE of all speed records, imagination is still swifter than wings. Let us, therefore, outstrip space and time, and fancy that we are already standing on the site of ancient Ur, an early forerunner of modern Baghdad and once the capital of the greatest empire in the middle East.

We shall imagine, too, that we have at last made our painful way across the sandy mounds that bury the ancient ruins and are standing on the topmost point of the city's most imposing monument, the Ziggurat, the skyscraper of the ancient East. From the top of this tower that has withstood the shocks of time for 5,000 years, the traveler, whether he be from London, Paris, or New York, may best scan the bleak horizon. Primed as he is with stories of the ancient greatness of Ur, he will, perhaps, realize with a shock that the former metropolis of the Ancient World lies now an abandoned dust heap.

As far as the eye can see, all is desolation: no water, no vegetation, no sign of modern habitation; the only living creatures are a few jackals prowling the ruins in search of food. But if only by some miracle we could project ourselves in the spirit 5,000 years back, what a transformation would there be!

THE DUST HEAP THAT WAS UR THE METROPOLIS 5,000 YEARS AGO

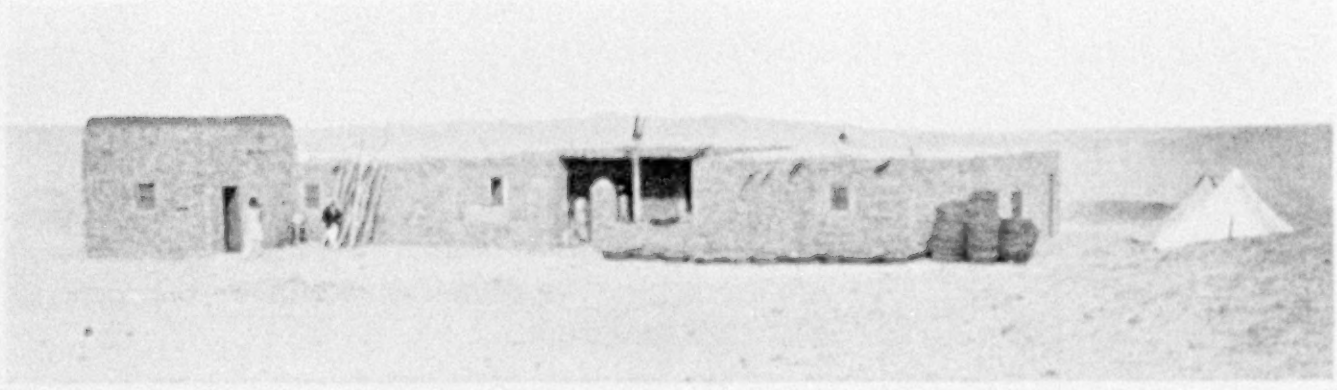
Let us imagine that the change happens at dusk, at the still hour when the East begins to revive after the exhaustion of a boiling day. Suddenly, instead of the dry sand and the refuse of bricks and pots, the desert transforms itself into a network of canals. We find ourselves at the quayside of the grand trunk canal that connects the north with the Persian Gulf. In the dimness of evening the black forms of great barges, moored to the quays by stout creaking hawsers, sway rhythmically in the evening breeze. On the banks we perceive the figures of burly bargemen, naked to the waist, clothed in sheepskin shirts.

As we strain our ears, we hear oaths uttered in a broad-sounding, uncouth tongue. It is Sumerian, the speech of the dominant people, and their vitality is attested by the brawn of the bargees, the methodical quickness of the scribes who are making their last entries on the bills of lading, and the careful stacking of the great bales of corn, wool, hides, and pottery in the warehouses.

It is only a glimpse caught through the half light of the open shell-shaded lamps, with their wicks flickering in the sesame oil, but it is enough; for all that we have seen is attested by the remains that issue from the soil year after year. Such is the Ur as we may see it in the mind's eye; and it is no fanciful picture, for every detail can be vouched for by the documents and designs, the treasures and tools, that have been unearthed by years of patient spadework.

A glance at the map (page 101) reveals the strategic importance of the ancient city. Ur lies hard by the banks of the Euphrates, in the southern half of the great alluvial plain which has been formed by the deposited silt of the rivers Tigris and Euphrates. Geologically speaking, south Mesopotamia is a comparatively recent formation. It is a land reclaimed from the sea by the fertile mud deposit of these, the two great rivers of antiquity.

About 8,000 years ago, as scientists surmise, the waters of the Persian Gulf had receded sufficiently to allow the neighboring desert dwellers to enter the country and reap the profits of cultivation.



THE EXPEDITION'S HOUSE AT UR IS CONSTRUCTED OF BURNT BRICKS

DIGGING THE EXPEDITION'S HOUSE OUT OF THE SAND

Every year, when the Ur party returns to its work in the autumn, three days are spent in clearing the headquarters house of the sand which has drifted against it (see text, page 106).

SHEIKS OF THE MUNTAFIK ARABS, FAMOUS IN IRAQ WARS, RAIDS, AND FEUDS

During the World War they fought with their old enemies, the Turks, against the British. Some of their dependents are now employed by the excavators at Ur.

The first chapter of the first book in the Bible tells about this. "Let the waters under the heaven be gathered together unto one place, and let the dry land appear. . . . And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit. . . ." The whole picture is palpably written from the point of view of the man who has watched the gradual recovery of a rich land from the sea and the change from marsh to field.

THE SUMERIANS CALLED THEIR GREAT TOWER "THE HOUSE OF THE MOUNTAIN"

The ziggurat, or staged tower, was a striking feature of Mesopotamian cities. The Tower of Babel, the most famous of all, was a Semitic edition of the Sumerian version. The reason for the ziggurat seems to lie in the fact that by origin the Sumerians were a mountain people and their gods were gods of the hills, but when they came into the flat plains of the Euphrates they had to build artificial hills on which to worship in the traditional way.

ONE OF THE FIRST CITIES BUILT AFTER THE CREATION

The oldest traditions, too, assure us that Ur was among the first of the cities founded in the land; indeed, according to the Babylonian cosmology, Ur came into being not long after the Creation, and by creation was meant the creation of Babylonia. And, furthermore, Ur was the first city to boast an empire after the Great Flood.

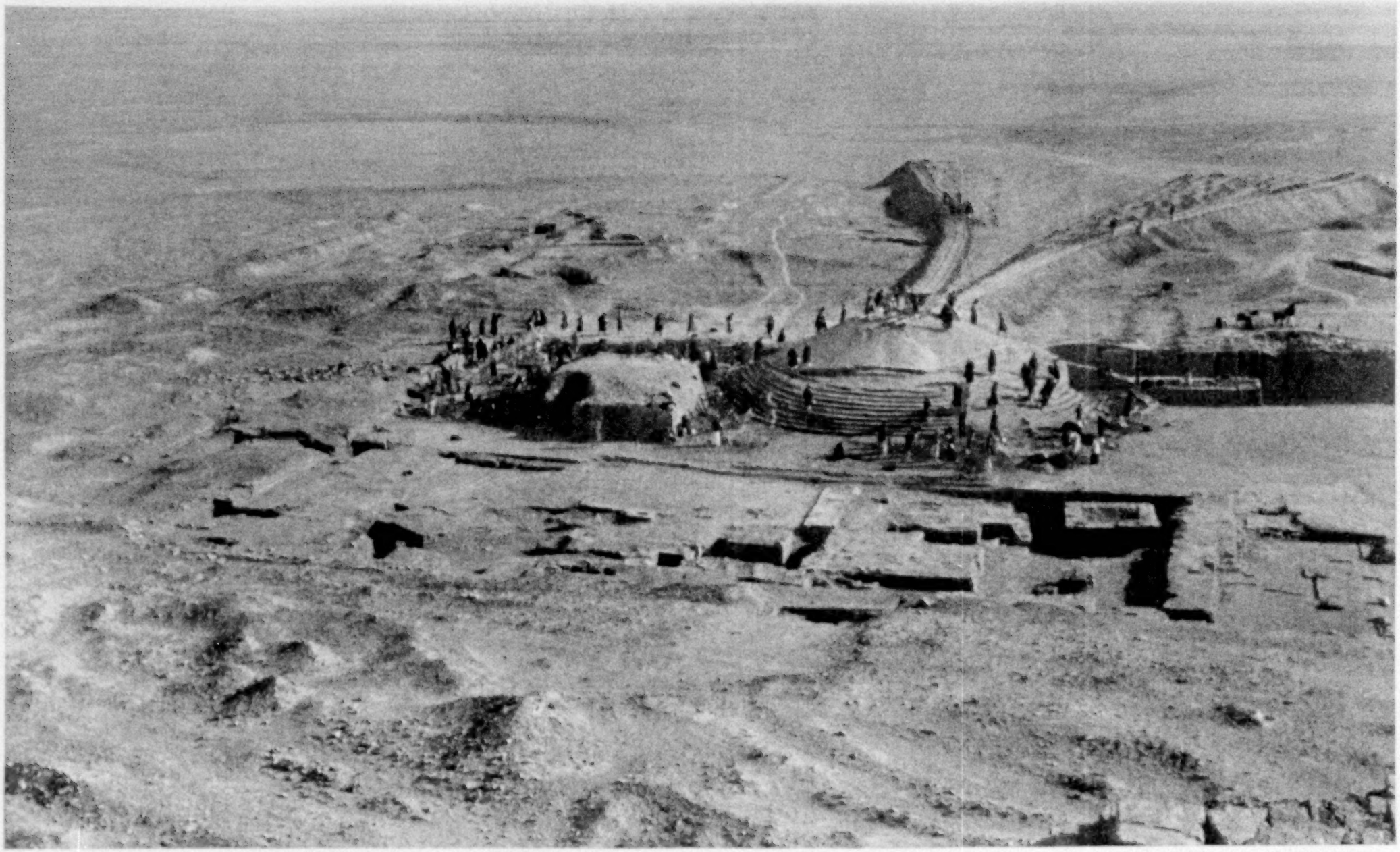
Excavation has confirmed the evidence of the earliest historical records in revealing that Ur was originally a city built on an island in a marsh; its subsequent growth and development are, therefore, all the more extraordinary.

The change which caused Ur to evolve from a mere hamlet to a rich city, second to none among ancient capitals, was due primarily to the genius of the race that exploited the newly formed country. The people were the Sumerians, of whom we caught a glimpse on the quays of our ancient city. Not that the Sumerians were the first to enter this land, but inasmuch as they were the first people in the region who had acquired the art of writing and of metal-working, so they were the first to exploit the country intelligently.

They first built cities; they consolidated their new territory; they instructed their barbarous neighbors in the arts of metallurgy, writing, and of war; they reclaimed the adjacent desert from its primeval

UR-NAMMU BUILT THE ZIGGURAT, HIS GREATEST MONUMENT, 400 YEARS BEFORE ABRAHAM WAS BORN

Arabs are filing up and down its triple stairway. A similar spectacle was probably common 5,000 years ago, when processions of the Moon God's priests and a stream of worshipers went up and down the stairs and across the tree-set terraces to the jeweled sanctuary that crowned the tower. The Ziggurat measures more than 200 feet in length and 150 feet in breadth. The building has a core of solid mud bricks with a skin of inscribed burnt bricks eight feet thick. All the burnt bricks are stamped with the name of Ur-Nammu (see text, page 114). In the sides are "weeper" holes for the purpose of drainage. Had they not been made, the damp absorbed by the core from the upper levels would have burst the burnt-brick skin.



IN UR'S HEYDAY THE GREAT COURTYARD, NOW UNDER EXCAVATION, MADE AN IMPOSING APPROACH TO THE ZIGGURAT

Storerooms line it on three sides. Since the Moon God was a great landowner, his tenants, as well as worshipers, came to the temple to pay rents and tithes in kind, coined money being unknown. Here the countrymen brought their cattle, sheep, and goats, their donkeys laden with sacks of barley, with jars of oil and rounds of cheese, clay pots of clarified butter, and bales of wool. The temple servants checked and weighed everything, and the scribes, making out receipts on tablets of damp clay, handed one to the clamoring peasants and filed the duplicate in the temple archives.

QUITTING TIME AT UR

The men's vitality is remarkable, for after a hard day's work of excavating they will run home singing and dancing. By nature they are far from industrious, but under intelligent supervision they become both keen and efficient. Prosperity came to the ancient Sumerian through his ability to educate and stimulate the native.

barrenness and applied the waters of the two rivers to their enrichment. Great things came out of small beginnings, and that alluvial plain which lies between modern Baghdad and the Persian Gulf changed from sea to marsh, from marsh to dry land, and, in its final transmutation, into the center of an empire. Nature rang the first changes, but the Sumerians reaped from them, and their ingenuity has made them immortal.

Seven years ago these Sumerians were a race known only to a handful of learned scholars whose lifetime task was the decipherment of their inscriptions. Now the name is familiar to all intelligent laymen who keep abreast with the most recent investigations in ancient as well as modern discoveries.

But even to-day the real importance of our rediscovery of this ancient people is only beginning to dawn upon the thinking world. Could we but imagine that after several thousands of years the civilization of America would collapse under the stress of a series of tremendous catastrophes, and then completely disappear from the memory of man, except in the vague

MODERN IRAQ IS STREWN WITH REMAINS OF ANCIENT CIVILIZATIONS

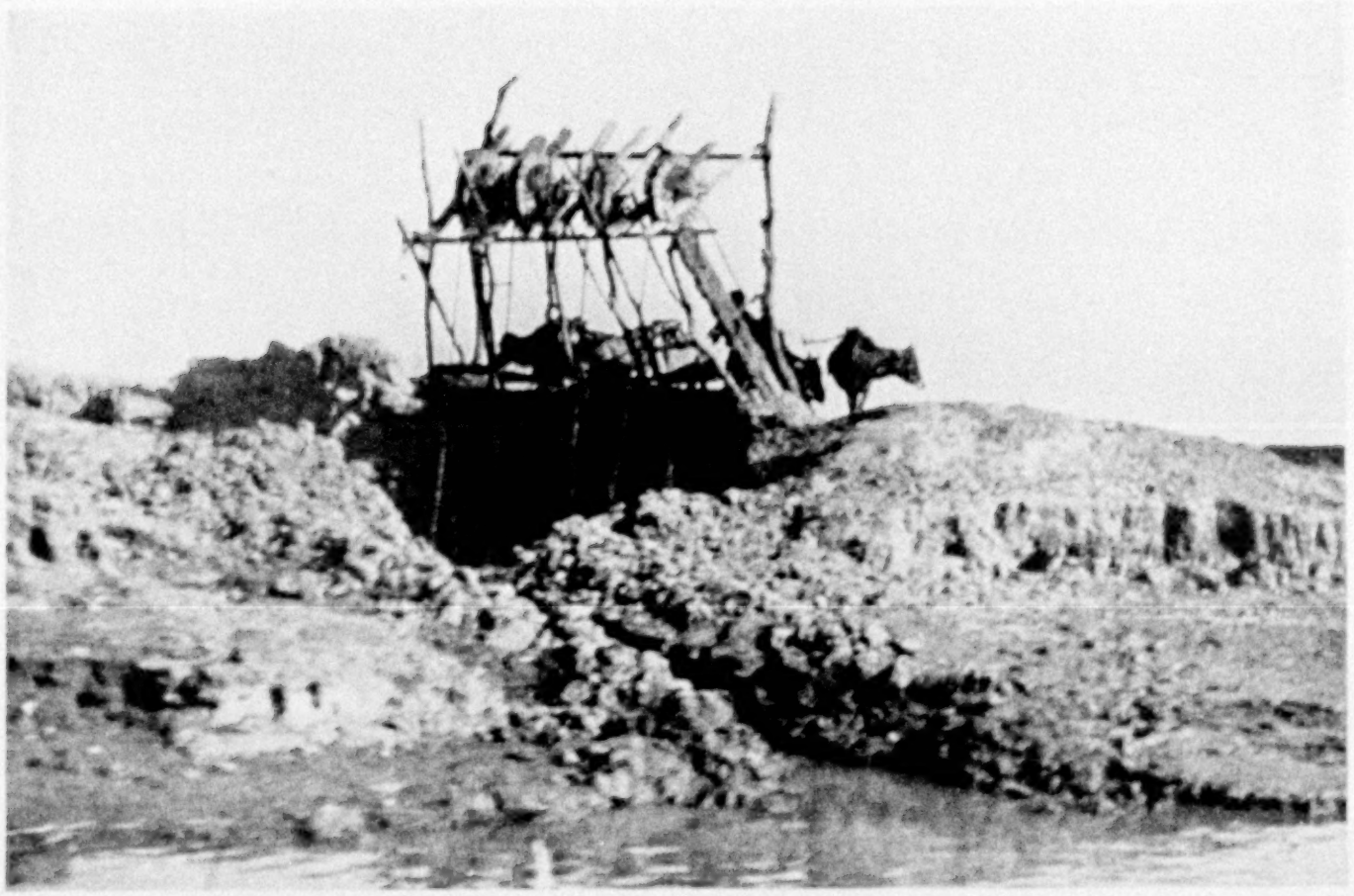
At Babylon, Nineveh, Opis, Hir, Naifar, Chehariz, Thumail, Erech, Kish, and Hatra, as well as at Ur, the spade of the archeologist unearths treasure-trove that helps to translate for modern man the engrossing story of earlier peoples.

remembrance of a few fabled traditions, we should have a parallel not so far removed from that of Sumer.

AMERICA AND BRITAIN COÖPERATE IN REVEALING UR

What impression would such a discovery make upon the world? It would come as a profound shock to every thinking man; but shocks are not always immediate in their repercussions; a great piece of news takes time to assimilate. Even so, to-day we are beginning to assimilate novel material, and with every fresh discovery we become more conscious of its magnitude.

It is to the credit of America and England that when, after the World War, the opportunity came for excavation in Mesopotamia, both countries used it to the utmost, and seven years' work has abundantly justified the faith and foresight of the promoters of these archeological expeditions. Year after year the joint expedition of the University of Pennsylvania and the British Museum, under the brilliant direction of Mr. C. Leonard Woolley, has thrown fresh light on the dead city



ROUND AND ROUND, PATIENT OXEN PULL THE TIGRIS WATER WHEELS

Oxhide sacks resembling great leather boots are suspended by ropes and are lowered and raised by oxen harnessed to a wheel. Another form of ox-power lift is used in irrigation, wherein the draft animal moves up and down an inclined plane.

ERECH'S RUINS MAY PROVE A TREASURE HOUSE FOR SOME ARCHEOLOGIST

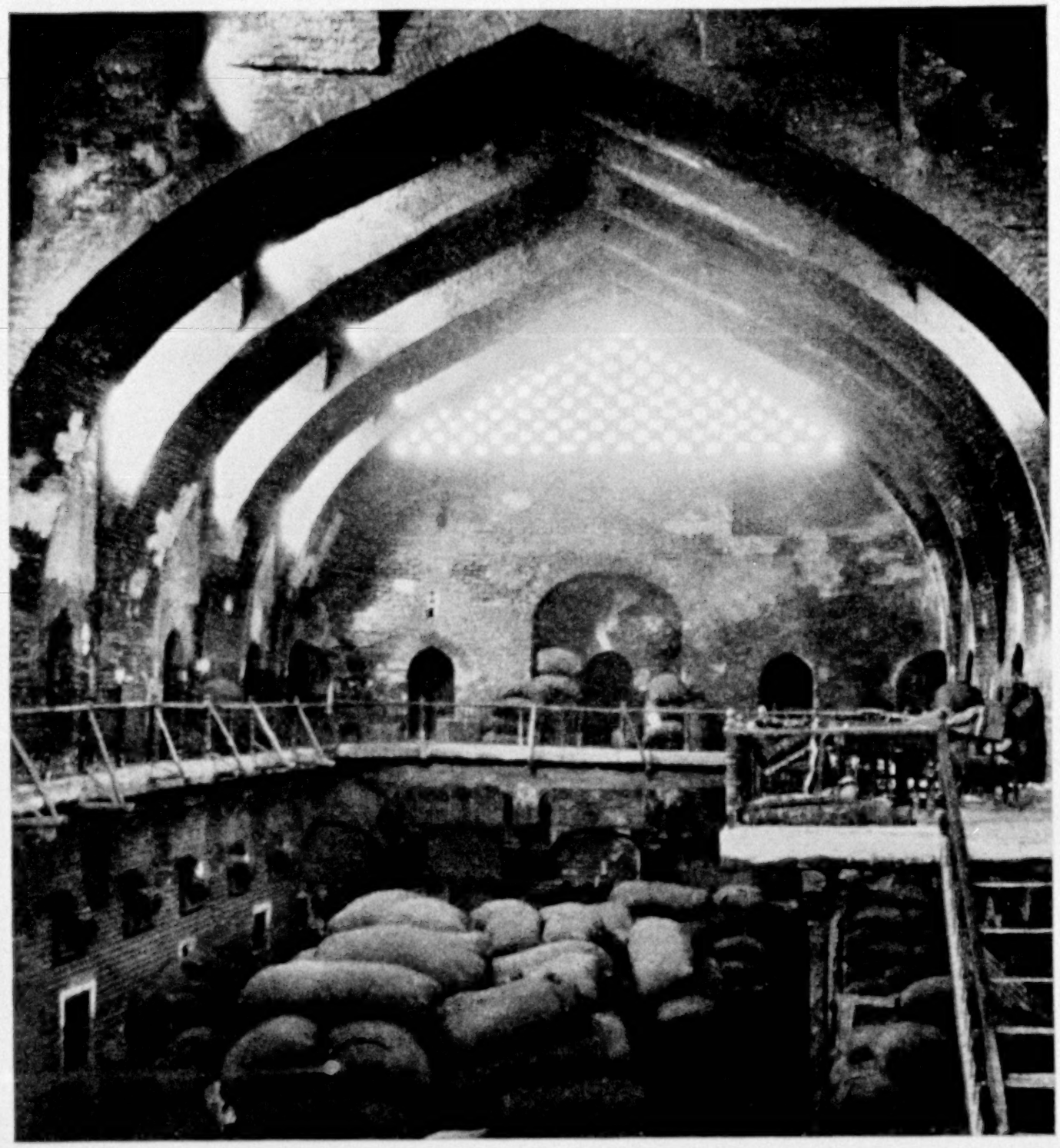
First Kish, then Erech, then Ur had its day of power among the Sumerians, who knew it as Uruk. Erech lies some 40 miles, as the crow flies, northwest of Ur, and is so inaccessible that, with one exception, no modern excavators have given it serious attention; yet within a circumference of six miles are three large mounds and many small ones. The huge surrounding walls, built by that Augustus of his day, Ur-Nammu, are still fairly intact. Genesis x, 10, mentions Erech as one of the cities of Nimrod, "mighty hunter before the Lord."

THOUGH KINGDOMS RISE AND FALL, THESE KURDISH FERRYMEN CARRY ON

In Iraq these proud, ancient people live chiefly east of the Tigris, in Mosul, Erbil, and Kirkuk, but parts of their old territory now belong to Turkey and Persia. They fought the Sumerians and figure in their oldest records. This ferry plies the Great Zab River.

AL FALLUJA IS SITUATED ON THE SO-CALLED "BOTTLENECK" OF MESOPOTAMIA

The Euphrates and the Tigris flow close to each other at this point, then diverge (see map, page 101). Over Al Falluja's bridge of boats most of the cars and caravans coming from Syria cross the Euphrates. In the desert near this town, 50 miles west of Baghdad, is a landing field for the Cairo-Baghdad Air Mail. Near by is the battle field of Cunaxa, where the defeat of Cyrus the Younger led to the immortal "Retreat of the Ten Thousand" under Xenophon.



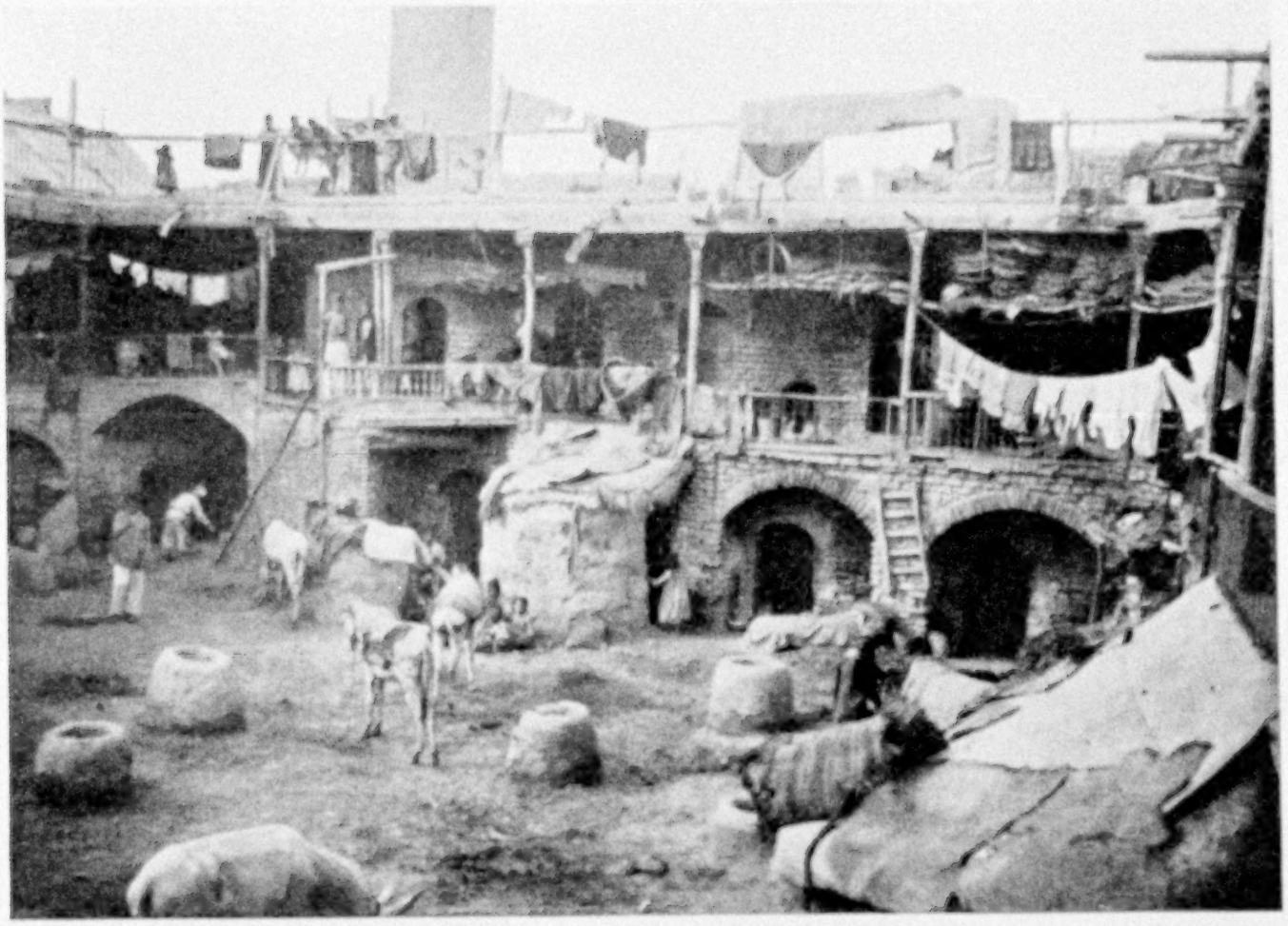
ANCIENT STOREHOUSES IN BAGHDAD ARE UTILIZED TO-DAY

In the center are bags of wool, which have been brought in from points up the Tigris and along the Persian frontier to be baled for export.

of Ur, and with it on the great people to whom the better-known empires of the Levant, Assyria, Greece, and even Rome, owe their heritage.*

The lost site of Ur had been identified as far back as 1854 by J. E. Taylor, the British consul at Basra, who discovered inscribed clay cylinders belonging to a Babylonian king, relating his restoration of the ancient tower, the Ziggurat, about 550 B. C. Experts at once realized the significance of the find, but it was many years before readers of the Bible were startled into realizing that Ur of the Chaldees, mentioned in the Book of Genesis as the home of Abraham, was in very truth to be indicated precisely on the map. The home of the great Jewish patriarch was hereby definitely proved to be no

* See, also, "Archeology, the Mirror of the Ages," by C. Leonard Woolley, in the NATIONAL GEOGRAPHIC MAGAZINE for August, 1928



A KHAN, OR CARAVANSARY, AT BAGHDAD

Such inns are built around the four sides of an open courtyard, to which there is access by a single wooden gate, locked at night to bar intruders. Animals are stabled in the yard; the guests occupy the cells above and below the balcony.

literary fiction, but a city to be ranked among the great capitals of the past.

A FICKLE RIVER MADE AND UNMADE UR

The three pieces of ancient tradition that associated Ur with the Creation, the Flood, and with Abraham are in themselves remarkable, and on all of them we can now throw light that would not have been available seven years ago. But these are mostly concerned with the beginnings of Ur; there is one question more remarkable still that is concerned with its end.

How came a city of such tremendous importance to have been lost to the world for more than two thousand years? For the last literary mention of Ur was made by an obscure writer called Eupolemus, in the second century B. C., and from that date its position seems to have been lost to memory.

The answer is simple. The same factors that brought it into foundation brought it into annihilation. Ur was the child of the River Euphrates and was born in that alluvium whose formation we have already described (see text, page 95). Its position fits the words of the poet Omar Khayyam, for it lay "upon that narrow strip of herbage strown, that just divides the desert from the sown."

Now, that narrow strip of herbage depends upon the river, and the great rivers of the world are as powerful as they are fickle, unmaking to-morrow what they have made to-day. In 5,000 years of Mesopotamian history, nothing is so obvious as the dependence of the great ruling powers on their irrigation system. Sumerians, Babylonians, Assyrians, Persians, Greeks, and Turks stand or fall by their power to control the rivers, and the same problems beset the British mandate to-day.

Ur is no exception to the rule. Once it stood five miles to the east of the Euphrates, but now it stands five miles to the west; so that in the space of 5,000

THE BRIDGE OF BOATS AT AN NASIRIYA

In a violent flood season such bridges are often smashed to pieces. An Nasiriya, eight miles to the east of ancient Ur, is the nearest native settlement (see, also, illustration, page 107).

years the river upon which it owed its dependence, both for commerce and fertility, has shifted its course by more than ten miles. From the earliest days Ur had to be maintained by an elaborate system of canals, whose upkeep taxed to the utmost the organization, wealth, and man power of the community. When these collapsed the city collapsed, too. It is certain that by the middle of the fifth century B. C., when there was no longer a central authority to interest itself in its upkeep, there were not more than a few inhabitants eking out a miserable existence on what had once been the more glorious predecessor of Babylon.

SANDSTORMS PRESERVED UR FOR THE ARCHEOLOGIST

Finally these vanished, too, and Ur became so desolate and waterless a spot that there was only one living creature who could be induced to venture near it; it was the rare bird that seems to delight in frequenting the most outlandish and abandoned corners of the earth, that scavenger of ancient remains—the archeologist.

Conditions in the summer are so bad that for five days out of every seven the desert is enveloped in raging sandstorms. A scorching wind drives the fine sand with a violence that knows no restraint, and a man is foolhardy indeed if he attempt to weather the storm. Often the force of the driven sand is so great that the ears begin bleeding from the impact, breathing is difficult, and one cannot even see one's hand.

Only the Arab, with his uncanny feeling for ground, can maintain a sense of direction. Through tent door and window the sand makes its malicious entry and foils all attempts to read or write by obscuring the written page beneath its dust-brown film. At such times the Arab shrouds himself in his flowing *aba*, cov-

NOT EVEN THE RAILWAY CAN REVIVE ANCIENT UR

The site is about 140 miles south of Babylon, near the Baghdad-Basra Railway. The station at which archeologists and occasional visitors alight is nearly two miles from the ruins. Formerly Ur lay fairly close to both the desert and the sea and near the junction of the Tigris and Euphrates, but the change in the rivers' courses and in the coastline has relegated the ruins to the desert. Nasiriyeh (An Nasiriya according to recent official spelling) is a village across the Euphrates from Ur.

ers head, mouth, eyes, and nostrils with his *keffiyeh*, and resigns himself to Allah.

South Arabian legend tells of a sandstorm so violent that the great city of Ad was entirely buried and never heard of again. In the sandstorms of Ur we realize that the legend of Ad carries with it the stamp of truth. Year after year, when our expedition returns in the autumn, we spend three days clearing the house of the blown sand of the summer, which in places has drifted as high as the roof (see page 96).

THE SUMERIANS INVENTED A PICTORIAL SCRIPT

This will explain how Ur, unlike other great cities, has escaped the plunderers of later days. Babylon for centuries after its abandonment was pillaged for bricks by dwellers in the neighborhood, and other sites near enough to modern habitation have been ruined for the archeologist by Arab depredations. From Ur the Arab has kept so far aloof that the remains have been intact ever since their last evacuation, in the fourth century B. C.

The life of historic Ur can now be accurately fixed between 3500 and 400 B. C. Our main sources are twofold: the material remains and the literary remains.

Some description of the Sumerians' writings is necessary for a full understanding of their history. These people did not use paper or parchment, or the papyrus which is indigenous to Egypt and not to Mesopotamia. When they invented writing they took the most obvious material, the clay from beneath their feet, fashioned it into tablets resembling nothing so much as soap cubes, and thereon inscribed their signs with a metal stylus.

Like all writings, theirs originated as pictures, but rapidly became syllabic—that is to say, the picture, though carved to represent the image which it indicated,

WORKMEN HAULING IN AN UNUSUALLY HEAVY FIND

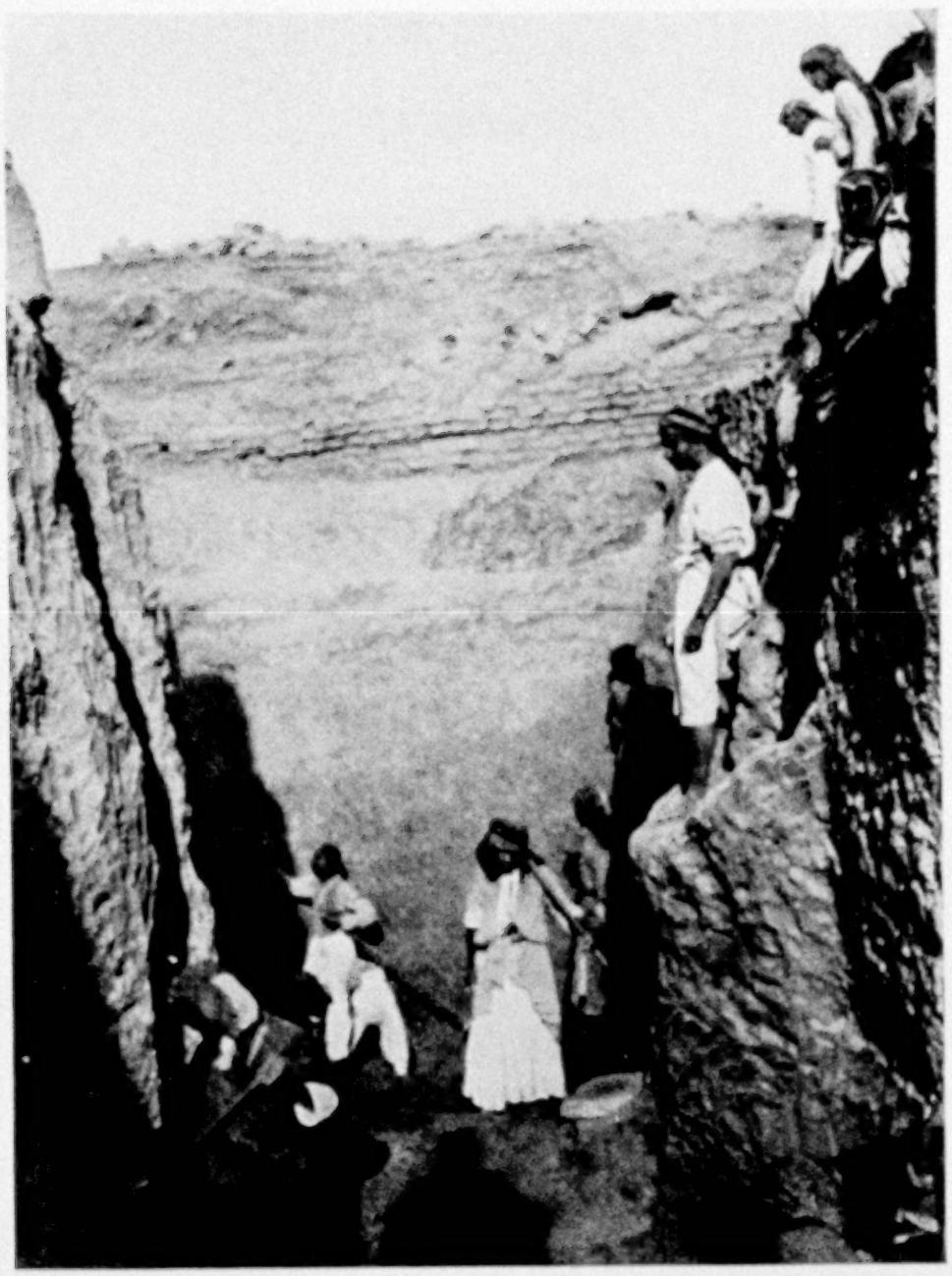
This was the inscribed stone recording the foundation of a Moon temple by King Bur-Sin in 2210 B. C. The men live on a canal five miles to the east. There they erect a temporary camp each year. When the season's work is over, each family packs its household effects onto a donkey and marches off.

CARE IS USED TO PREVENT LANDSLIDES

Digging proceeds from the surface in a series of terraces, so as to avoid the overhanging of dangerous embankments.

stood for a sound instead. Thus the picture of a bee, to take an English analogy, instead of representing a bumblebee, represented the syllable "be"; so that out of the compounded syllable of a bee and a witch the word "bewitch" could be made. The complexities and ambiguities involved in such a system were enormous, more especially when the Semitic-speaking peoples borrowed the Sumerian script and applied it to their own tongue.

Doubtless the awkwardness of the syllabic system may account for the comparative poverty of Babylonian literature. Those great epics of the Deluge and the Creation had to be handled by the Hebrews, who, having an alphabet, were able to make them the great epics of humanity. The Sumerians had cherished such epics, but their literary powers had been incapable of doing them justice.



FROM THESE TERRACES EARLY INHABITANTS OF UR THREW OUT RUBBISH THAT BECAME A BURIAL GROUND

Further soundings of this area should throw interesting light on the predynastic peoples.

The ancient historical data consist chiefly of comparative records derived from the elaborate compilations of Assyrian scribes who worked in the great library of Assurbanipal at Nineveh in the seventh century B. C. These indefatigable workers were engaged in recopying and transcribing histories begun 1,500 years before them, and they have perpetuated for us the chronological tables of the ancient world.

Records of eclipses and the interclash of nations, attested from different and often rival sources, have enabled the modern scholar to check the tables of his ancient predecessor, and though the gaps in history loom large, the repatching of the whole awaits the industry and good fortune of the archeologist, who from day to day unearths more and more of the lost material.

A KING RULED AT UR IN 3100 B. C.

The earliest certain date at which we may arrive is 3100 B. C., the date of the accession of Mes-Anni-Padda, the first king of the first dynasty of Ur. That is a date fixed by the consensus of modern scholarship to a margin of a hundred years on either side. We must admit the margin of error, but, in comparison with

ARAB JOB HUNTERS

Between 180 and 300 men are employed at Ur, according to the type of work on which the expedition is engaged. In the excavation of the cemetery, where the closest supervision is required, only a comparatively small gang can be handled, but on the excavation of a large temple, where thousands of tons of soil devoid of ancient material must be shifted, more men can be engaged.

the period involved, it is infinitesimally small.

"THE HERO OF THE GOOD LAND"

Even before Mes-Anni-Padda, our earliest historic king, we know of the names of royalty who were great powers in the land. From Ur the discovery of royal names inscribed on vessels and cylinders in the ancient cemetery takes us back to an approximate date of 3500 B. C. That there were kings in existence before that time is certain, but their names lie hidden, and we must wait until the middle of the fourth millennium B. C. reveals a well-developed civilization with historic names.

By that time the Sumerians, as we see them in Ur, were goldsmiths who could produce objects of use and beauty—daggers, helmets, and tools—unsurpassed at any period of history. Three years ago we unearthed the dagger of Prince Mes-Kalam-Dug, a name which signifies "The Hero of the Good Land." The dagger, which lay with about 150 other objects against the side of his coffin for more than 5,000 years, looked, when the soil was brushed away, like the finest production of the Italian Renaissance.

After Mes-Anni-Padda, the first historic king, there follow 2,500 years of history whose span we cannot possibly bridge in so confined a space. Let us content ourselves with a few of its most important aspects.

Of the first dynasty, which fell before the attack of a neighboring city about 2900 B. C., we know that its commercial relations took its merchants over vast tracts of Asia. Extensive use of gold, silver, copper, tin, and stones, such as carnelian, lapis lazuli, diorite, and obsidian, all unknown to Mesopotamia itself, proves that it must have maintained commercial relations with Asia Minor, Egypt, Syria, Persia, the Caucasus, and possibly Afghanistan and India. The kings whose trade led them so far afield were Sumerians.

Most of the fourth millennium B. C.

A NEAT HAND WITH A DAGGER IS OFTEN A NEAT HAND WITH A PICK

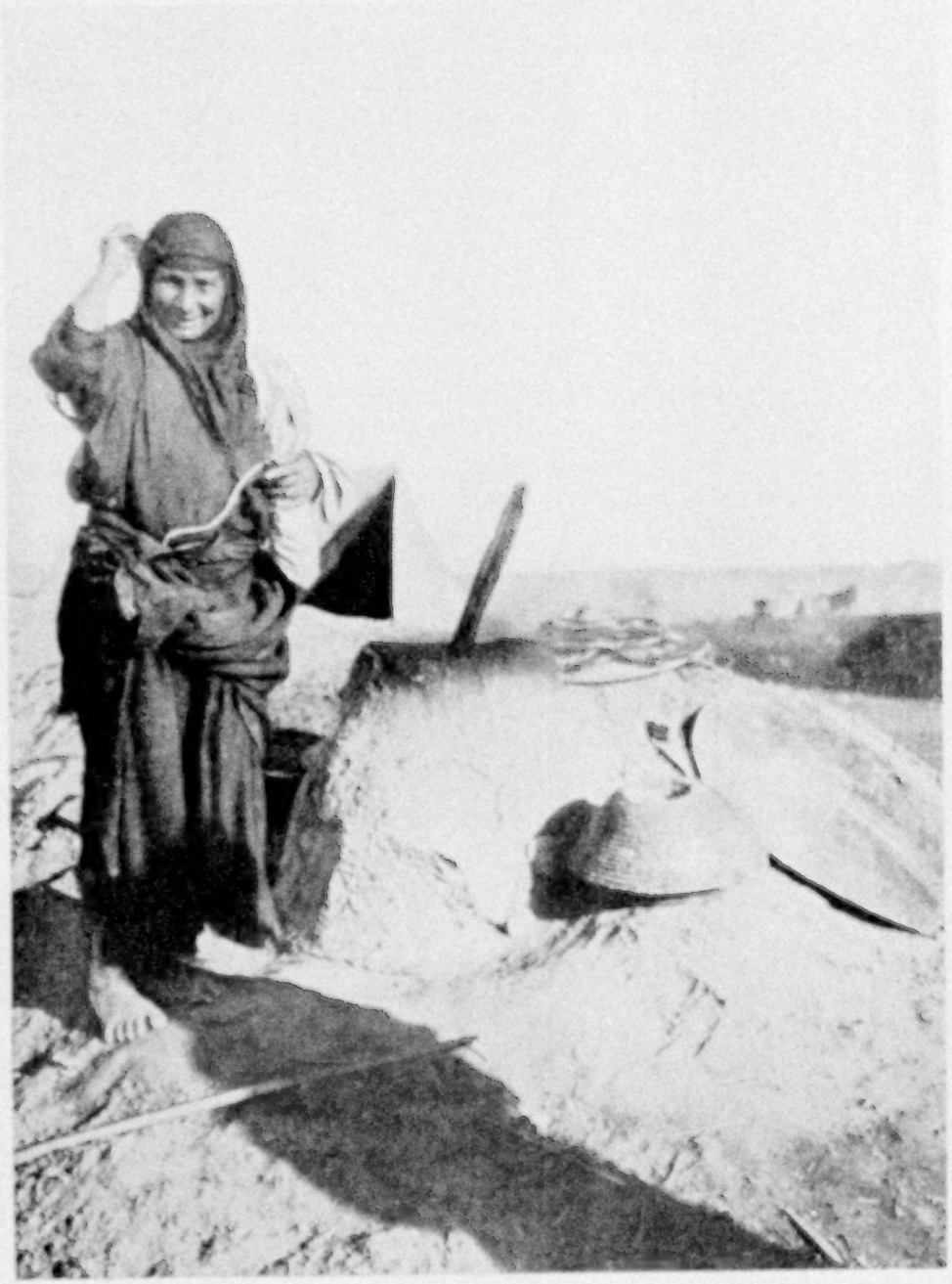
The workman in the Near East cannot always be selected according to European standards of reliability. No references are offered and none required.

THE GREAT DEATH PIT IN THE CEMETERY AT UR

The large shaft grave in the foreground contained 74 human victims, 68 of them women (see text, page 123.) The ancient surface lay about 20 feet above the floor level, which has here been reached. Also in the foreground is one of the trial pits, at the bottom of which the Great Flood deposit was discovered (see text, page 117).

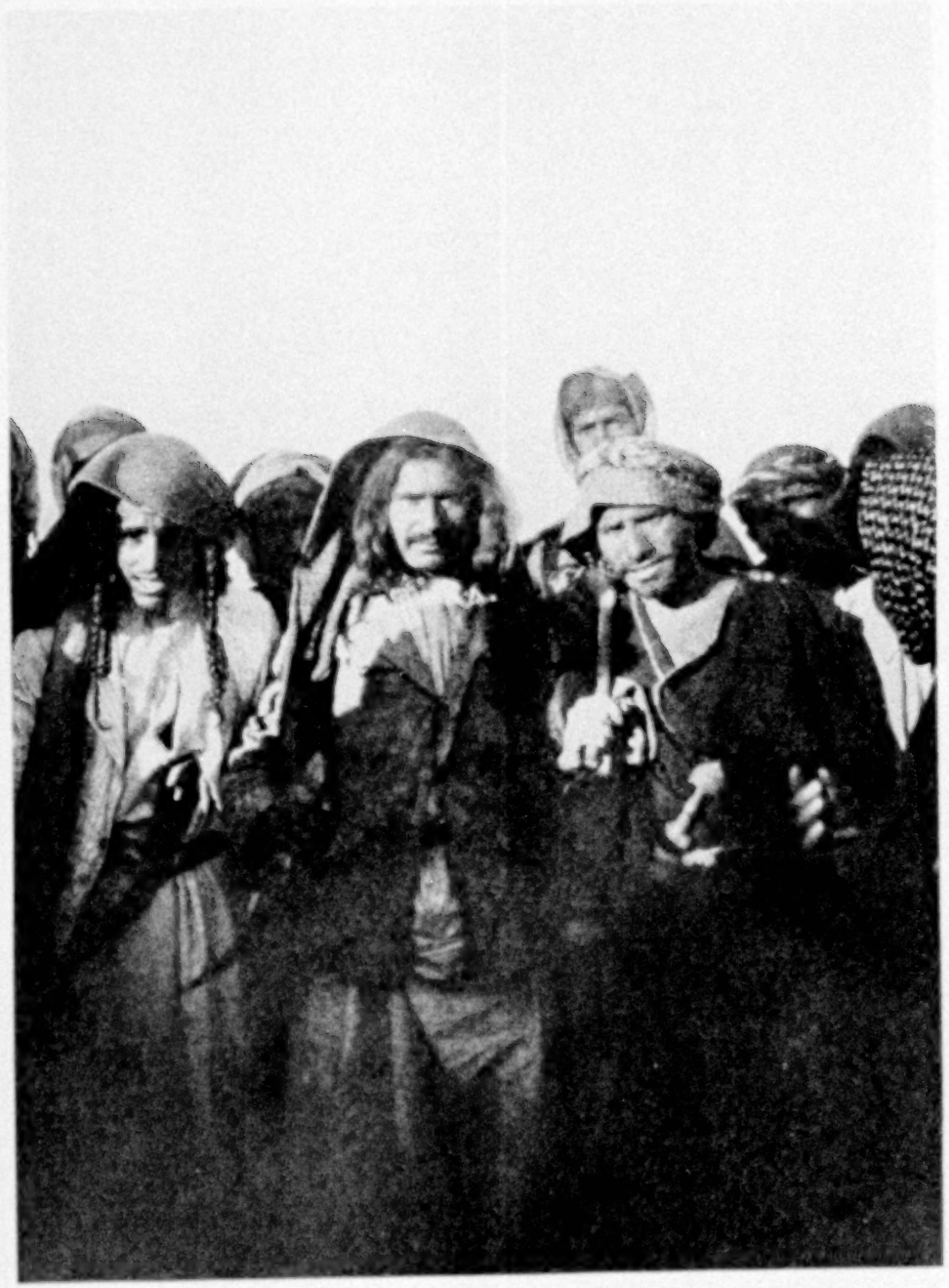
SATURDAY, PAY DAY AT UR

The men have a wonderful faith in the account book, which they say cannot lie. Their illiterate veneration for the written word is perhaps inspired by their reverence for the Koran, "the Book" as they call it.



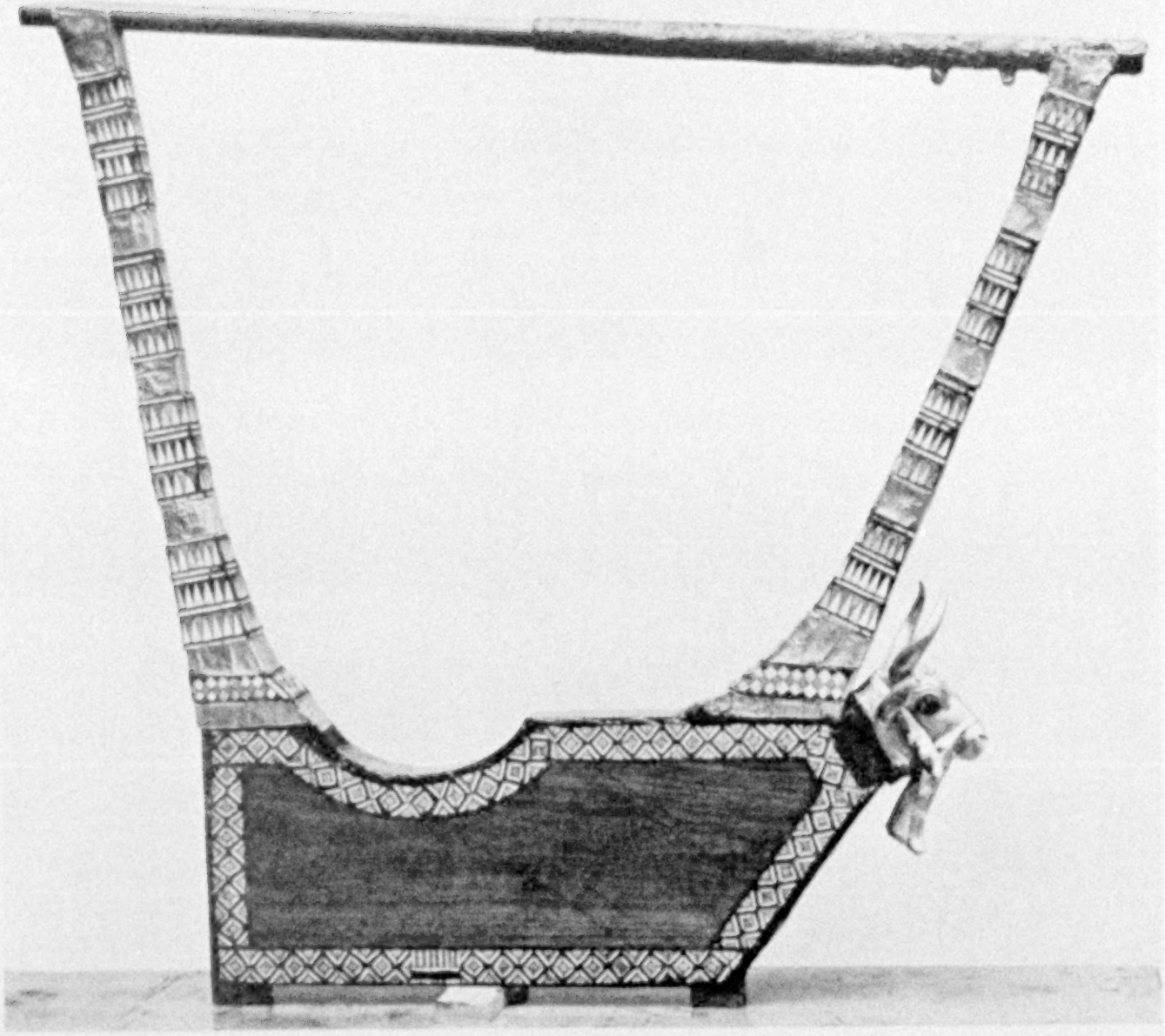
SHE BAKES BREAD THE WAY THE SUMERIANS DID

In addition to the beehive-shaped bread oven, the builders of Ur also had cooking ranges of fire clay with flat top and circular flues.



SOME OF THE MEN WHO DO THE DIGGING AT UR

After seven years' association with archeologists, many of the workmen enjoy being photographed, but the Bedouin still shuns the camera.

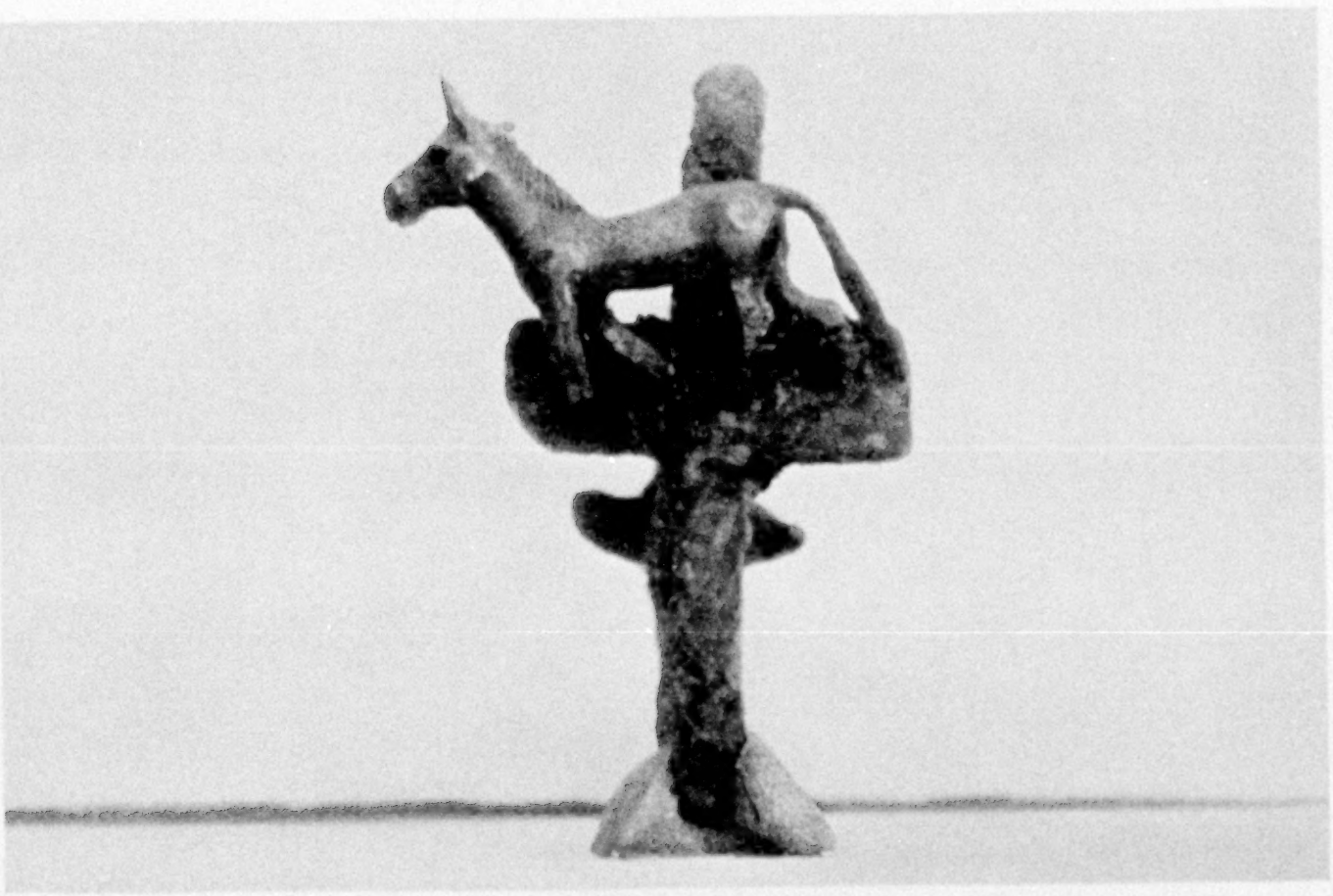


THE GOLD LYRE FOUND IN THE GREAT DEATH PIT

The most remarkable of four lyres discovered together (see, also, text, page 128). The wooden core had perished, but the mosaic inlay, executed in white shell, red limestone, and lapis lazuli, lay undisturbed in the soil, so that the whole could be restored to its original form and dimensions. The uprights have gold bands alternating with some of red, white, and blue mosaic. The front half of the crossbeam, to which the strings were attached, was plated with silver. From the front of the sounding box projects the bull's head shown on page 116. This harp, found in January, 1929, now belongs to the Baghdad Museum of Antiquities.

was typical of Mesopotamian history; it was a long period of wars between rival city states, during which Ur suffered an eclipse. At each of these cities excavation has revealed something of their heyday, and as one after another has fallen to the clash of arms, the archeologist rescues from the débris the trophies of their former rule. Thus the finest statues found at Ur were those buried beneath the ruins of the temple sacked by the soldiers of Babylon.

After 600 years of darkness, Ur revived for its last and greatest period of brilliance. In 2300 B. C. emerged a ruler by the name of Ur-Nammu, who once again established Ur as an independent city. Not only did he claim to be "King of Sumer and Akkad, King of Ur, King of the Four Quarters of the World" (that is to say, his kingdom was roughly the equivalent of modern Iraq), but he claimed to have "made straight his way from below to above." In other words, he marched by force of arms from the Persian Gulf to the Mediterranean.



THE PROTOTYPE OF THE MODERN MOTOR-CAR MASCOT

The model of a solid-cast electrum ass which decorated the rein ring of Queen Shubad's chariot pole (see, also, illustration below.) Nowhere is the Sumerian's mastery of metals better shown than in sculpture. The illustration is four-fifths actual size.

A GOLDSMITH'S MASTERPIECE FROM A ROYAL GRAVE

Man's material needs in the next life are much the same as in this one, reasoned the Sumerians, and the richer the man the richer the equipment provided for him in his grave. As goldsmiths the Sumerians had few equals. They created objects of use and beauty, such as daggers, helmets, tools, or this spouted and fluted gold vase (one-half actual size) from Queen Shubad's grave, which rival the finest products of the Italian Renaissance.

THIS BULL'S HEAD PROJECTED FROM THE GOLDEN LYRE

It is the finest sculptured head of its kind ever unearthed as a product of the ancient world (see text, page 128). The head is of hammered gold; the eyes are of shell and lapis lazuli. The weight of the soil above has crushed one side a little. The photograph was made before restoration (see illustration, page 114). The Sumerian Moon God is called "the young bull of heaven" and the crescent horns are his emblem. His blue lapis lazuli beard is extolled in religious poetry. The illustration is two-fifths actual size.

But more than this: he was to Ur as a builder what Augustus was to Rome. Only, whereas Augustus converted Rome from a city of brick to a city of marble, Ur-Nammu converted Ur from a city of mud brick to one of burnt brick. It is this period that has revealed the most splendid architectural remains.

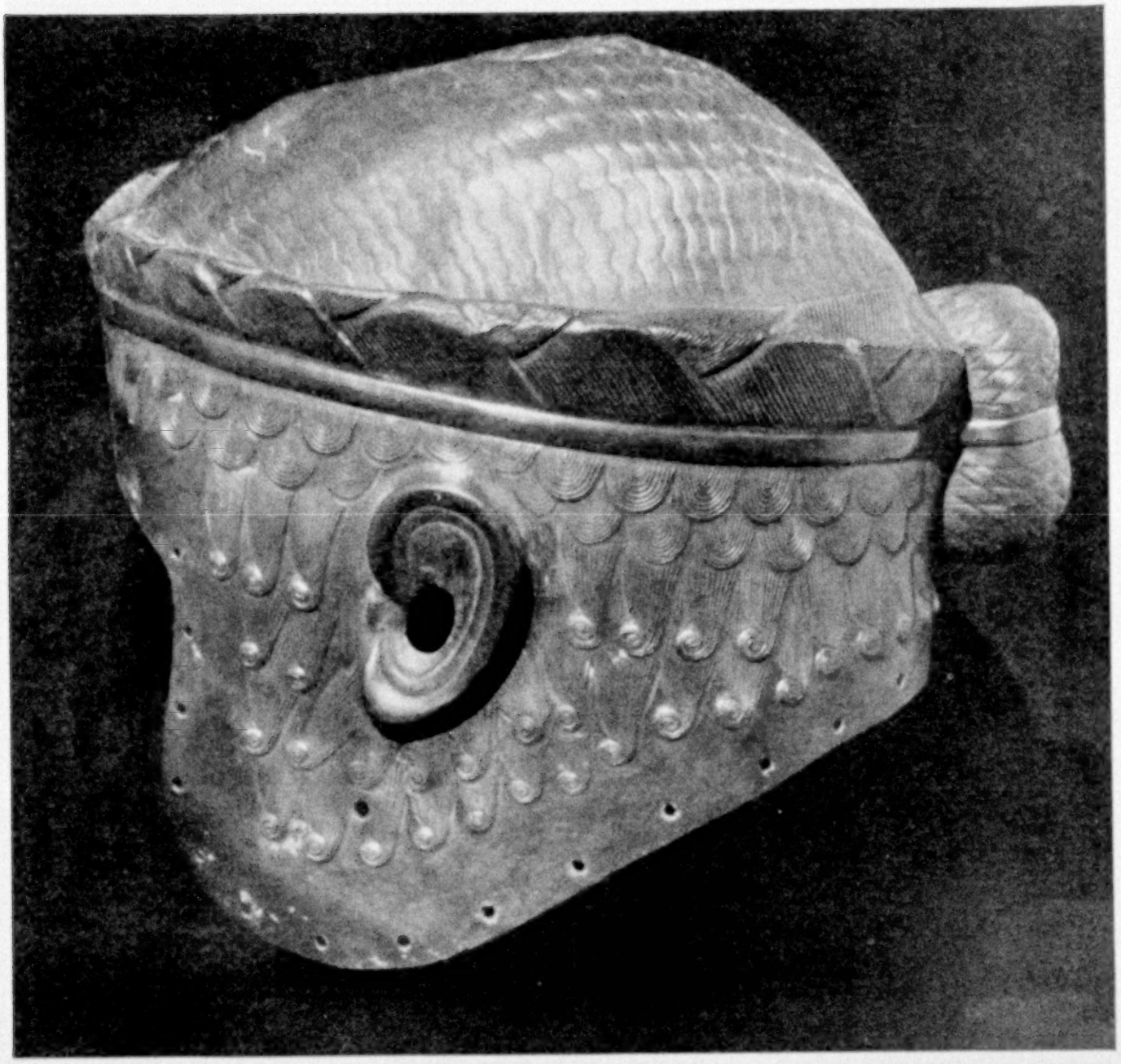
The labors of the expedition have been chiefly concentrated on the central portion of the city. In the first year the great inclosing wall that contained within it all the most important temples was traced for its entire circuit. This formed a great rectangular inclosure about three-quarters of a mile long and nearly a quarter of a mile wide.

Almost without exception, the temples were devoted to the worship of the Moon God Nannar, or to that of his wife, Nin-Gal, the "Great Lady," as the term implies. When one sees Ur bathed in a moonlight so brilliant that one can read without difficulty beneath its beams, it is not hard to understand how the city came to be devoted to its cult.

Outstanding among the buildings of Ur was the Ziggurat, a tower (pages 97 and 98), crowned with palm gardens and a chapel to the moon. There is some possibility that it may contain under it a treasure chamber or foundation deposit of an ancient king. To burrow beneath it will be a task of the future.

When, in 2170 B. C., Ibi-Sin, the last king of the dynasty founded by Ur-Nammu, was taken prisoner by the Elamites from Persia, the doom of Ur was sealed. A new city and a new people, Babylon with its Amorite, or west Semitic stock, had at the same time come into its own and nothing could stem the rising tide. Thenceforth Ur became subject to Babylon.

The Sumerian element was banished from the city to hide its shattered remains in the marshes of southern Mesopotamia and to lie in a seclusion from which it has



"THE HERO OF THE GOOD LAND" WORE THIS HELMET

This exquisite golden wig-helmet was found in the grave of Prince Mes-Kalam-Dug. The hair is rendered by engraved lines and the fillet binding it by a twisted band is also engraved. The side whiskers are represented in relief, the ears in the round. The helmet comes down to the nape of the neck and covers the cheeks. Illustration one-half actual size.

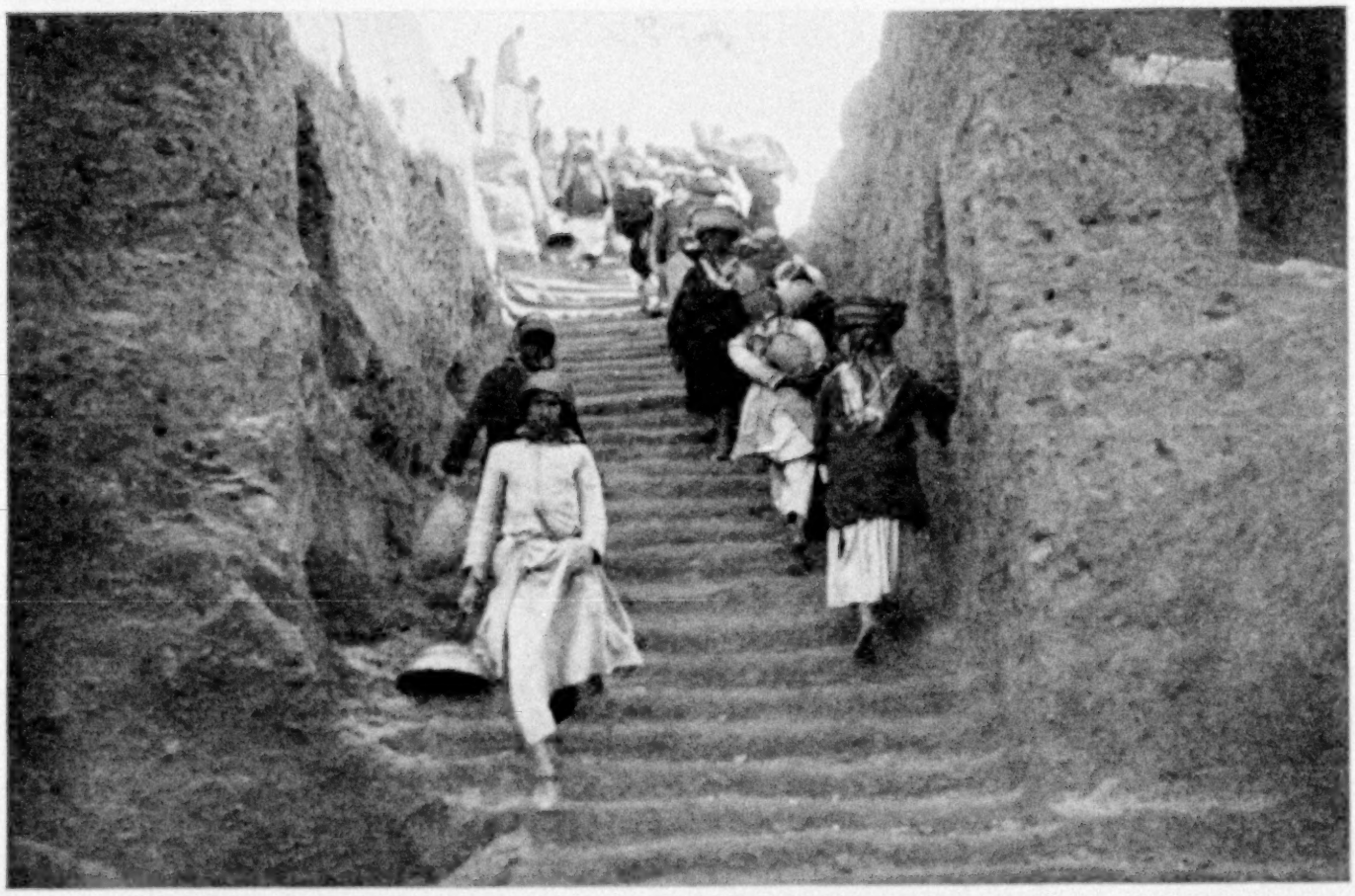
not yet emerged. Among the marsh Arabs of to-day we occasionally discern the Sumerian type. To that marsh which he first found upon his entry into the country 8,000 years ago, he has forever retired, and remains as difficult of access, as independent and resentful of interference from the outside world, as he is reluctant to interfere with it.

About 550 B. C. Nabonidus, the last king of Babylon, installed his daughter as high priestess at Ur, and when she opened a museum of antiquities the days of the once great city were numbered. All these things were symptomatic of an artificial interest that could not arrest the decline and fall.

AN ASTOUNDING DISCOVERY MADE IN A BANK OF CLAY

During the course of last season's campaign came the most astounding and the least spectacular discovery ever made at Ur. The discovery itself was made in the ancient cemetery, the site that has yielded the most magnificent and oldest treasures, containing burials that were laid down as far back as 3500 B. C.

The cemetery itself lies in a very ancient rubbish heap that has accumulated



A STAIRCASE LEADING DOWN TO THE CEMETERY

The great depth of last season's excavations was a considerable tax on the strength of the basketmen, for it involved the constant ascending and descending of steep staircases; but the rewards unearthed were ample compensation.

at the foot of one of the highest mounds in the city. This rubbish heap was obviously older than the cemetery, for it had to be completed before the graves could be dug into, and one would suppose that its character had to be forgotten before the inhabitants could consent to bury their royalty and distinguished men within it. It therefore became all the more interesting to see what lay underneath that ancient rubbish heap itself.

The trial pits furnished astounding evidence; and yet, as it was laid bare, it was presented in as simple and unobtrusive a form as could be imagined. There was no glitter of gold or royal grave—merely a clean, water-laid bank of clay eight feet deep, and beneath it again the remains of the most primitive civilization of Ur.

This ruined civilization consisted of relics that have always been regarded as the most primitive type of Mesopotamian implements—painted pottery, clay sickles, flints, terra cottas, and obsidian chips, with a sprinkling of metal—the products of a primitive people entirely distinct in their characteristics from the later Sumerian occupants of the country. And all this had been obliterated by that clean, uniform stratum of water-laid clay, *the result of a single deposit* and not of a series.

WAS THIS THE GREAT FLOOD OF GENESIS?

The meaning of the stratum became instantly obvious. Our clean bank of clay was the deposit of a great flood that had wiped out the primitive civilizations beneath it.

The casual observer might argue that such a find was only to be expected in a country whose two great rivers flooded annually, and that our clay bank merely indicated an ancient local flood. True, it was an ancient and a local flood in a sense, but there is every reason to believe that it was something very much more than this: *that it was the great Biblical Flood related in the Book of Genesis*, a flood that afterward came to be regarded not as a local but as a world flood.

The extraordinary importance of this discovery cannot be overestimated, and it is therefore all the more necessary to point out the salient features to those skeptics

A VAULT OF BRICK DISTINGUISHES THIS ROYAL TOMB AT UR, WHICH DATES FROM THE FOURTH MILLENNIUM B. C.

The limestone tombs, either those built wholly of stone or of stone walls with brick vaulting, are the oldest and most imposing. They were royal burial places, for in Ur stone, imported from a great distance, was an expensive luxury.

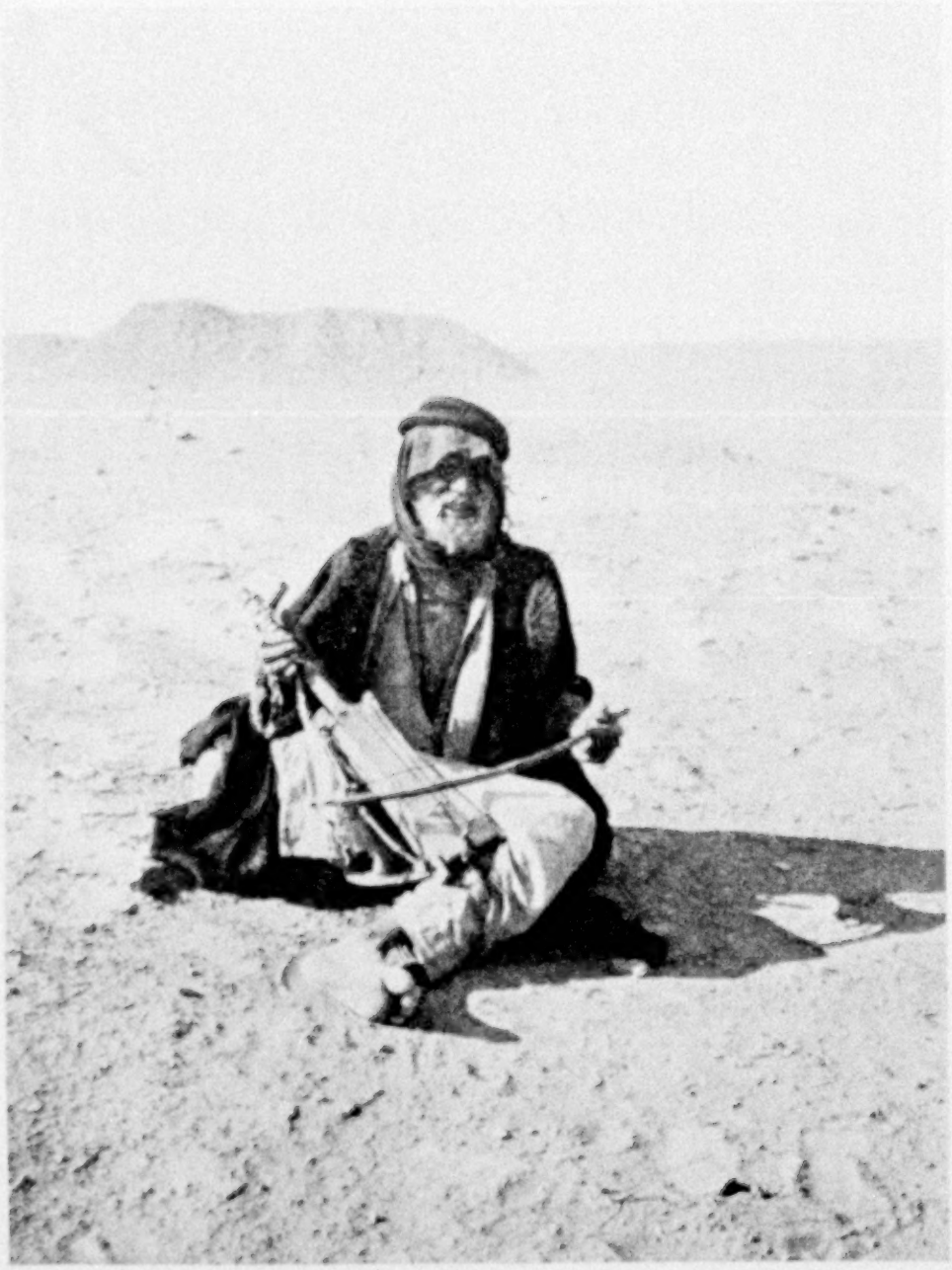
who will wish to disbelieve. The point to be considered is this: Does this flood discovered beneath the earliest known remains at Ur represent the World Flood, or does it not? It is well to remind ourselves here that our investigations are only at the beginning, inasmuch as they were made at the very end of last season; but that makes it the more remarkable, in that all the available evidence goes to prove that our flood involved a national and not merely a local catastrophe. Let us summarize what we know about it.

First and foremost, the remains beneath the flood deposit are the oldest and the deepest ever found at Ur. That is proved from the amount of soil cleared from the surface and from the age of the remains above.

Secondly, the particular type of civilization obliterated by the flood never again appeared; its outstanding characteristics, in particular the brilliant painted pottery, were wiped out from everyday use.

Thirdly, above the flood deposit came a new people, the Sumerians, who had just learned to write and whose earliest legends spoke of a great flood. The flood that they described was handed down to later tradition and finally became crystallized in the Genesis account, which corroborates the old tradition in almost every detail.

It is exactly at this moment, after a catastrophe which must have disorganized entirely the primitive village settlers of Mesopotamia, that we should expect a new element to appear in the country. The flood accounts admirably for the sudden rise of that highly civilized Sumerian element, a people who had migrated from the East and obtained the ascendency at the most opportune moment. The memory of the flood accounts for their skill in architecture, their consistent erection of buildings on high terraces, and their construction of the Ziggurat, which was simply an earlier edition of the Tower of Babel. The discovery of that flood stratum



A BLIND ARAB MINSTREL BEGS FOR ALMS AT UR

The flute and trumpet, harps large and small, the lyre (see illustration, page 114), the drum, tambourine, and cymbals were known to the Sumerians. In the temples, in separate chambers, priestesses taught music to girls who wished to adopt it as a profession.

harmonizes the evidence of legend, history, and geology in the most amazing manner.

THE SUMERIAN NOAH RELATES HIS ADVENTURES IN THE ARK

To show the literary parallel of the Genesis account, we may quote extracts from one of the early Babylonian tablets written in the wedge-shaped cuneiform script. Ut-Napishtim, the Sumerian Noah, tells of his adventures within the Ark:

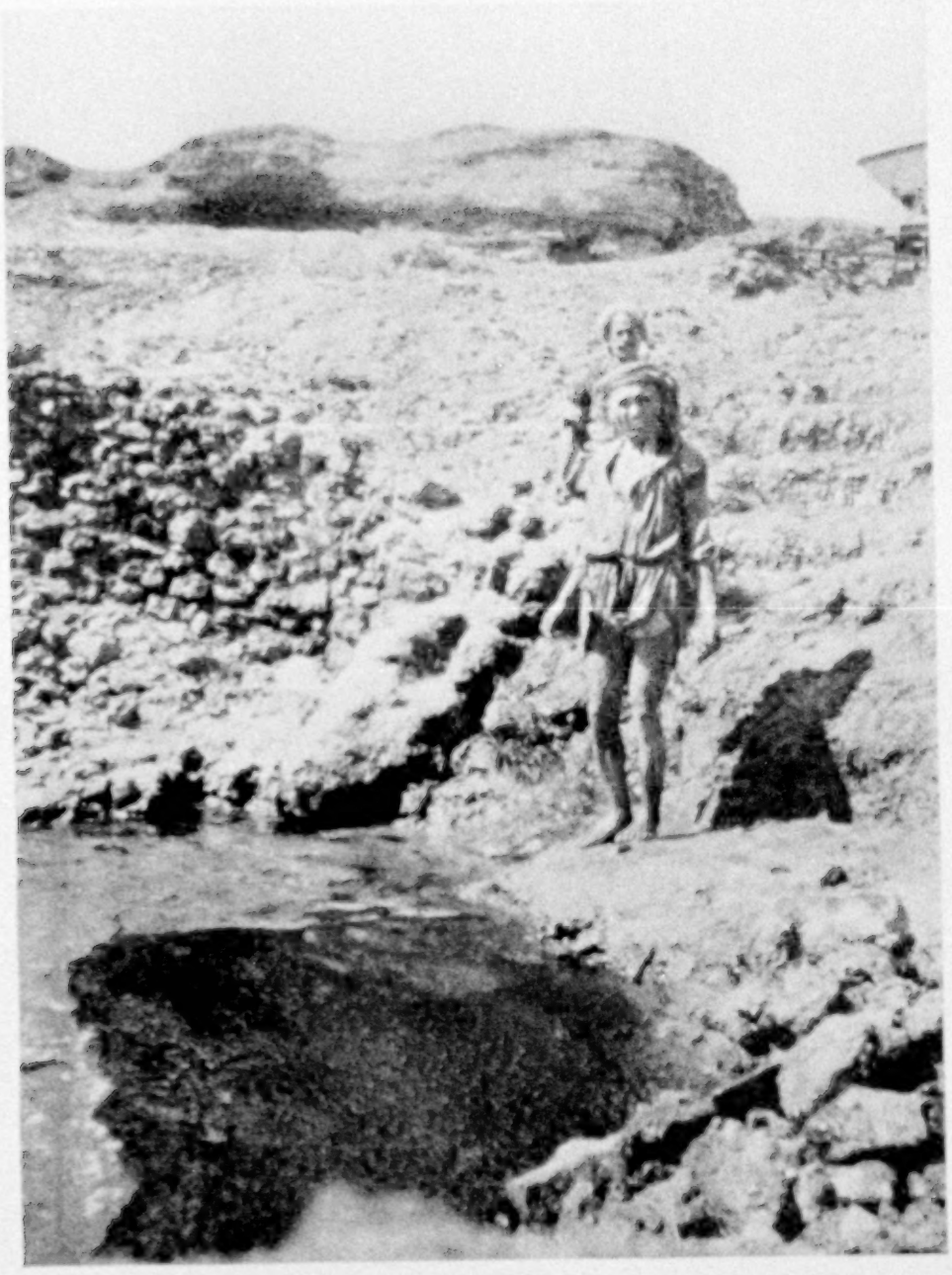
Six days and nights
Raged wind, deluge and storm upon the earth.
When the seventh day arrived the storm ceased
Which had fought like a host of men;
The sea was calm, hurricane and deluge ceased.
I beheld the land and cried aloud:
For the whole of mankind were turned to clay;
Hedged fields had become marshes.
I opened a window and the light fell upon my face. . . .
When the seventh day arrived,
I brought forth a dove, and let it go:
The dove went to and fro:
As there was no resting place it turned back.
I brought forth a raven and let it go:
The raven went and saw the decrease of the waters.
It ate, it waded, it croaked (?), it turned not back.
. . . . . .
I offered sacrifice.
. . . . . .
The gods smelt the savor.
The gods smelt the goodly savor.
The gods gathered like flies over the sacrifice.

The resemblance in detail to the Genesis account is remarkable, and the picture presented is pregnant with the atmosphere of Babylonia. The account is, as it were, saturated with the clay and marsh of an alluvial country; there is the receding of the water, the oncoming heat, and the gathering of the flies. How vivid is the story in its simplicity!

That story must be supplemented with further evidence from the soil. We cannot but wish to know more of this flood. Its effect on the imagination has caused it to survive to the present day in legend, so that the ark represented on stone plaques of 5,000 years ago is still the plaything of the 20th-century child.

Apart from the discovery of the flood, last season's work in the cemetery con-

tinued to yield magnificent loot. It was the Sumerian belief that a man's material needs in the next life were much the same as they are in this one, and the richer the man the richer the equipment provided for him in the grave. The most splendid period for funerary offerings seems to have been about 3300 B. C., when wealth was well distributed and abundant and the royal house lavished not only gold and silver but men and women, too, as the accompaniment of a king or prince.



"SLIME HAD THEY FOR MORTAR"

The "slime" mentioned in Genesis is bitumen, and these wells at Hit have been a source of supply for thousands of years. On the surface collects a filthy scum, black, thick, and wrinkled—the asphalt of commerce. The Arabs scoop it up on palm leaves and store it in large pieces, to be used as a coating for boats and as a mortar for buildings. Asphalt from Hit bound bricks in Ur, and also, Herodotus says, in Babylon's walls. Some of the straw or palm-leaf jugs made at Hit to hang on a certain type of water wheel are smeared inside and out with bitumen.

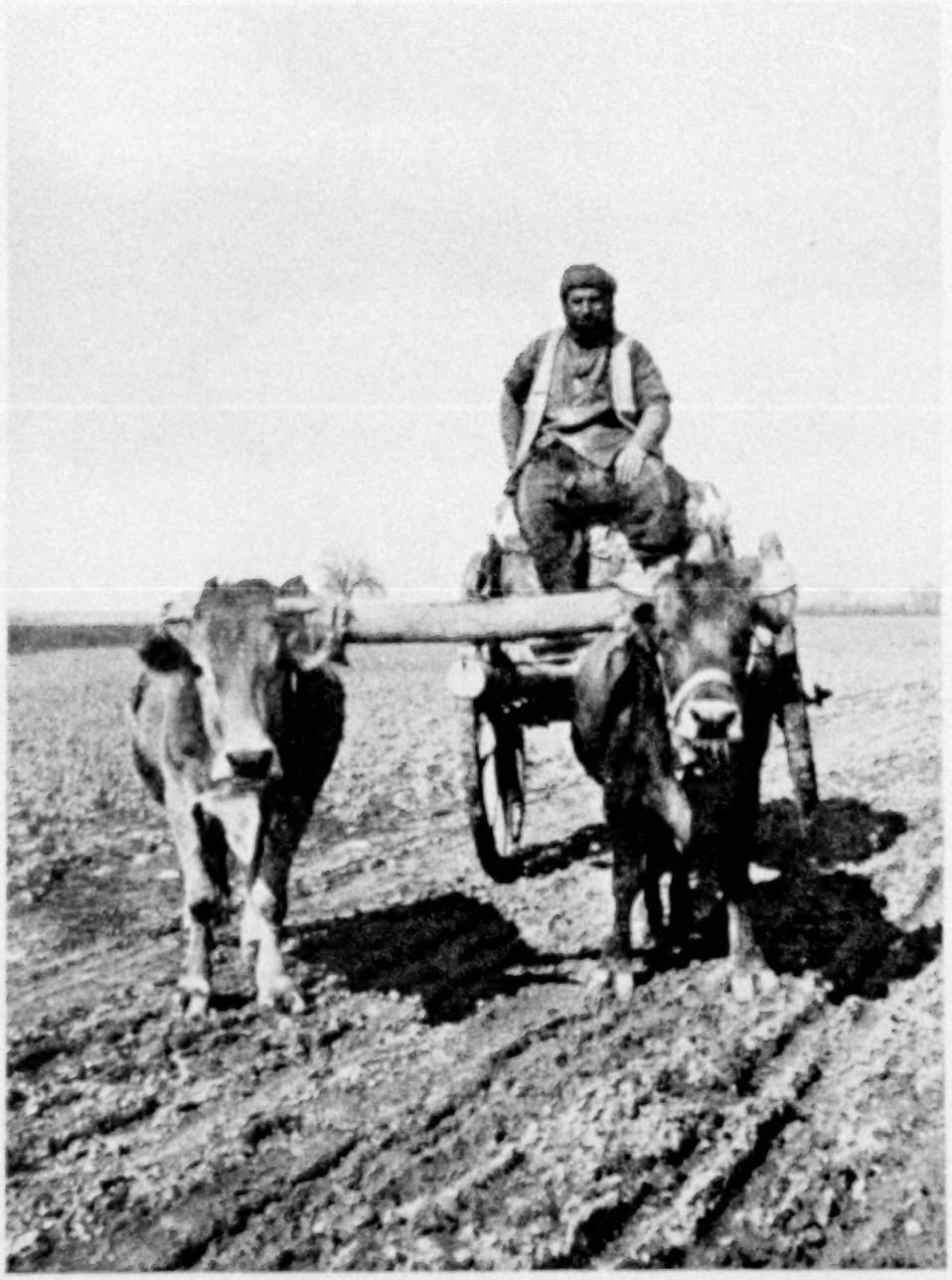
GRAVES REVEAL HUMAN SACRIFICES

These shaft graves, with their human sacrifices, most interesting, if most gruesome, of all methods of burial, proved as abundant in 1929 as hitherto, and there was evidence concerning the funeral rites which was more interesting and instructive than any yet known.

One of these graves consisted of a shaft dug to a depth of 30 feet below surface level. At the bottom was a single chamber surmounted by a dome, the earliest intact domed tomb chamber known in the world. The entrance led to an open court and the construction reminded one of a miniature mosque.

The dome had been erected over a wooden ceiling which had eventually crashed onto the brick floor, covering up the five occupants. Four were servants and the fifth was a woman, most probably of royal blood, if we take into account a cylinder seal inscribed with the name of King Mes-Kalam-Dug (see text, page 110), from the same shaft.

The principal occupant was dressed in the brilliant court costume of the period. She wore a headdress of gold ribbons radiating in seven strips from the center of the head, a wealth of gold poplar leaves strung with carnelian and lapis lazuli beads, and around the neck gold



OX-CARTS HAVE BEEN FOUND IN THE EARLIEST ROYAL GRAVES AT UR

The Sumerians also used oxen at the plow and on the threshing floor at harvest time. The horse was yet unknown in Mesopotamia. Cattle, goats, and sheep provided milk, cheese, and the sour cooking butter which the East loves. Meat was probably a luxury only for the rich, though the poor might taste it occasionally at sacrifices on feast days. In modern Iraq the use of wheeled vehicles is still restricted, away from the main lines of travel, and the most common means of transport from outlying districts are pack mules and camels. This ox team works at Mosul.

chains and carnelian beads. Her cloak was fastened at the shoulder by a heavy gold pin with a curved head surmounted by a carnelian bead; she had gold earrings and finger rings; at her hand was a fluted gold tumbler.

Last but not least, she possessed an engraved gold cylinder seal, the first of its kind ever found in Babylonia. On the seal were depicted men carrying offerings, one of which was a lyre surmounted by a bull's head, exactly similar to those found in the other graves.

EVIDENCES OF FUNERAL FEAST

Numerous were the vessels of copper, stone, and clay, but the offerings in the court outside the tomb and in the filling above the dome were more interesting still.

The court itself was littered with animal carcasses, including a sheep. At this stage the grave had been filled in again with earth halfway up to the level of the dome; then fires had been lit in the four corners and numbers of earthen vessels and ashes indicated that a funeral feast had been held. Then, again, earth was shoveled in, and at various stages there were dependents, butchered to serve their mistress in the next world, and more offerings in the shape of clay vases.

Among the other offerings higher up in the shaft, within a brick vault, was a wooden box containing two superb gold-bladed daggers and the cylinder seal inscribed with the name of the king, before mentioned (see text, page 121). The vault that contained this box had been destroyed by later intrusive burials, but it is probable, from the analogy of other graves, that the structure had been surmounted by a funerary chapel, within which commemoration sacrifices took place from time to time. The meaning of those sacrifices we shall consider in

THE "MAHAILAH" IS THE MOST COMMON TYPE OF CARGO BOAT SEEN ON THE TIGRIS AND EUPHRATES

Miniature boats discovered in the ancient cemetery at Ur prove that this type has been in use for at least 5,000 years. The mahailah has a high, forward-sloping mast, a huge rudder, lateen sail, cut-away barbed prow, and a poop boarded over for the crew.

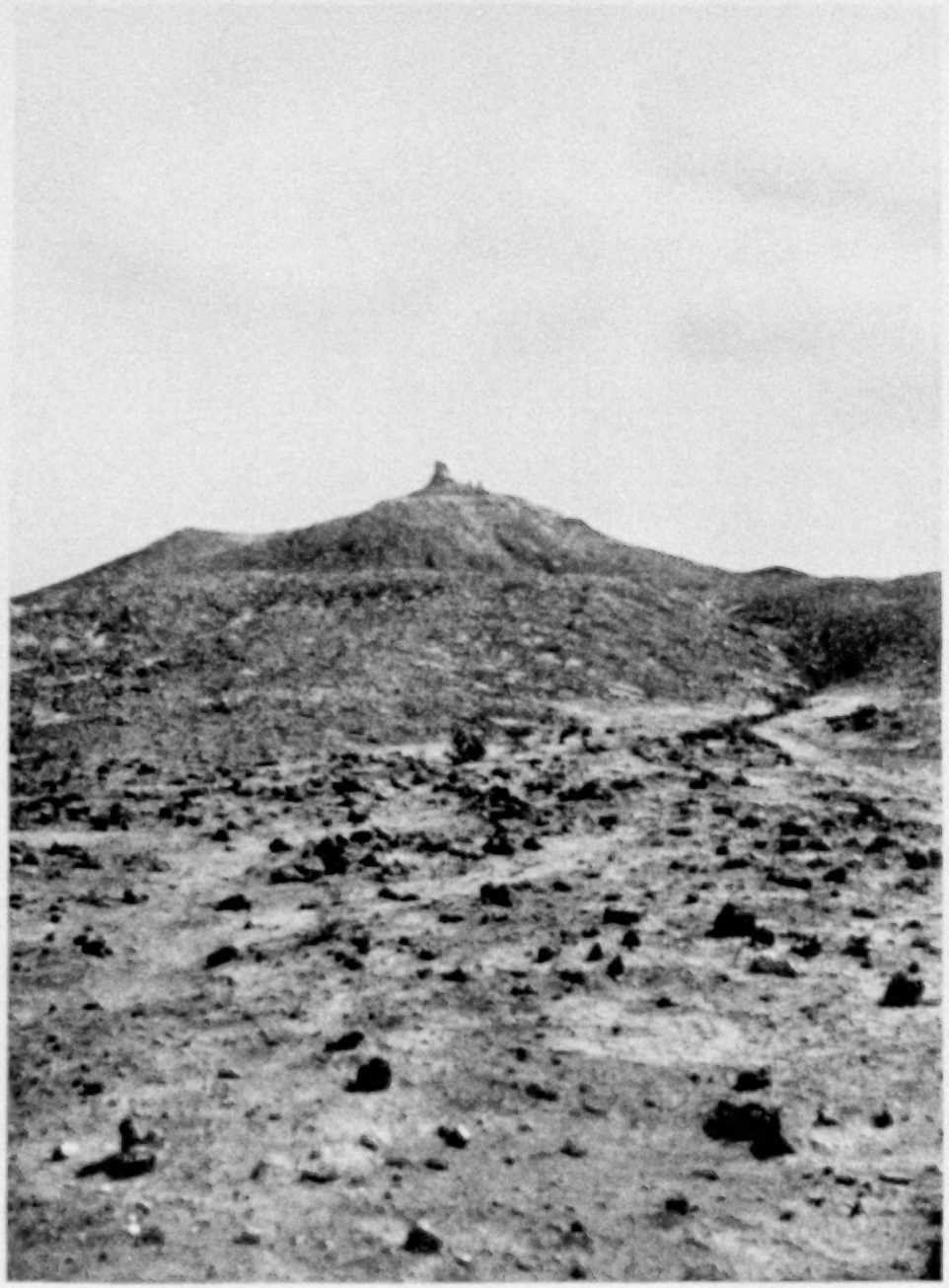
a moment (see text, page 128). We shall pass first to a rapid survey of a second holocaust of human victims found about the same time in the near neighborhood.

This again consisted of a shaft grave measuring 27 by 25 feet, and contained no less than 74 victims, 68 of whom were women. A sloping ramp led from the surface into the bottom of the shaft.

A CARPET OF GOLD JEWELRY

The treasures lavished on the dead were remarkable for splendor and number. As we cleared the shaft to the level of the floor, it appeared almost as if we were treading on a carpet of gold, such was the wealth of jewelry. The women, lying in ordered rows, were decked out after the fashion of the principal occupant of the domed chamber. Hair ribbons of silver or gold were almost invariable and many of the gold ribbons bore marks of exquisitely fine network, the veiling now entirely decayed that had once shrouded the head.

So great was the weight and quantity of jewelry on the heads that the women must have worn wigs that were both large and substantial. Indeed, the last traces of the wig—a dark, powdery, crumbling

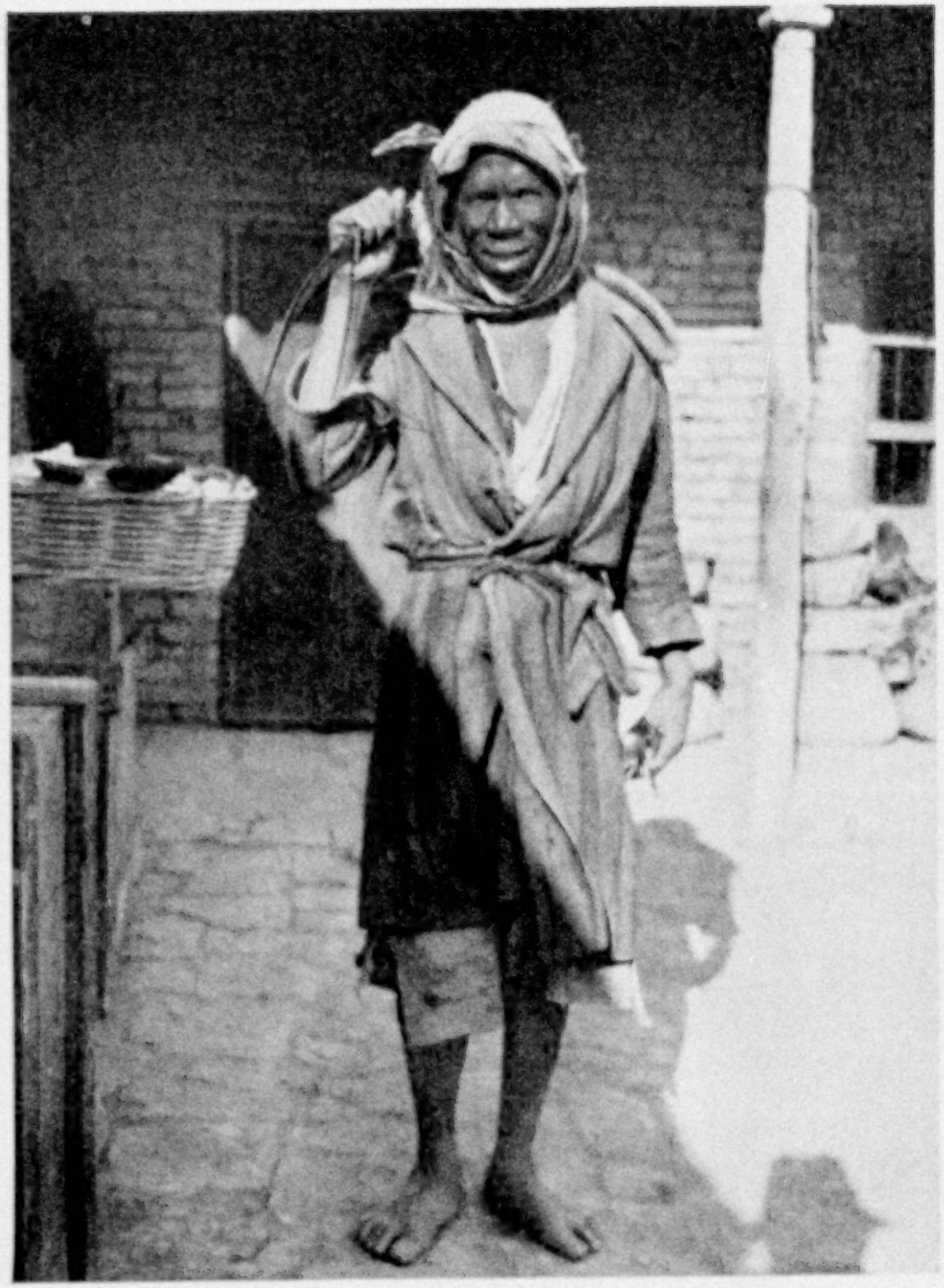


A PROPHET'S TOMB AND A MOSLEM SHRINE

The mound of Nebi Yunus, at Nineveh, is the legendary burial place of Jonah, who thundered at the wickedness of the great Assyrian capital. Up to the present native fanaticism has made excavation impossible here.

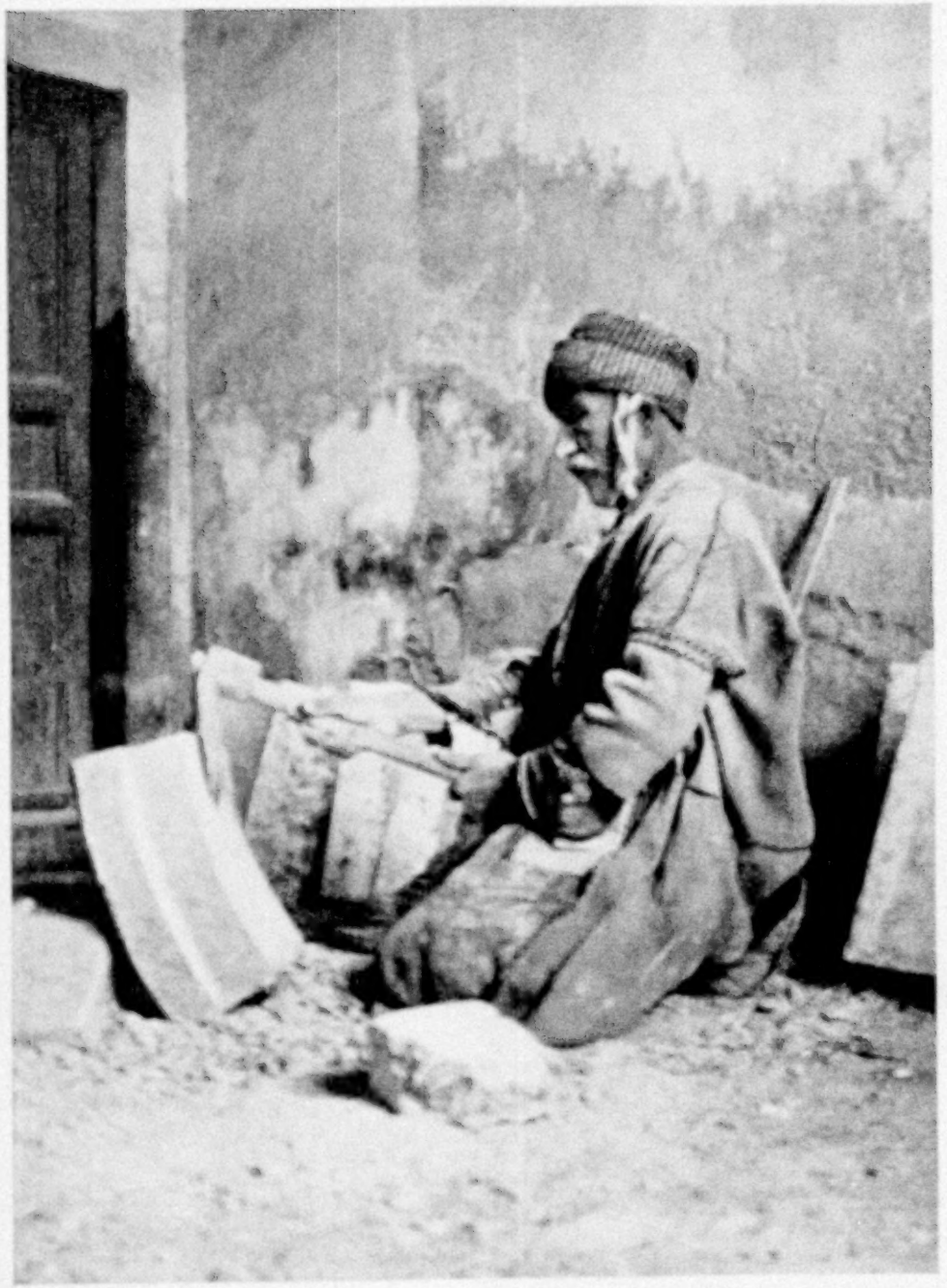
FLOOD CONTROL ON THE TIGRIS

The land between the two great rivers of Mesopotamia has often been submerged, so the experiences of the ages call for precautions to-day. Reed mats are being used to reënforce the banks.



IT IS HIS JOB TO AMUSE UR'S EXCAVATORS

Zuweir comes of an African family formerly enslaved by the Arabs. He keeps the men lively by performing the part of official buffoon. Despite invasions by Semites, Sumerians, Kassites, Medes, and Persians, Mesopotamia's population is about the same to-day as it was 5,000 years ago, the only new racial type being the Negro.

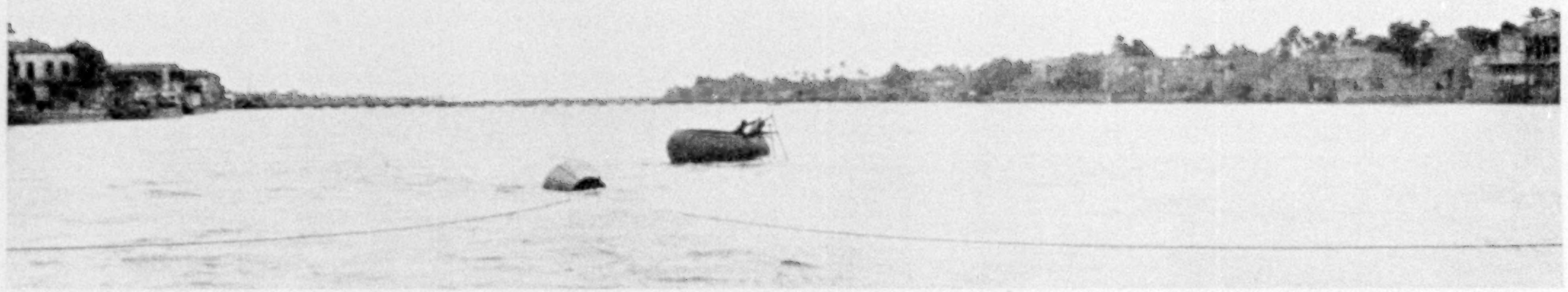


TO MODERN MESOPOTAMIANS, OLD WAYS ARE THE BEST WAYS

An Arab mason is fashioning the voussoir of an arch with a metal adz similar in type to the copper adzes the Sumerians used in 3000 B. C. Though the arch in building was unknown to Europe until Alexander's conquests, Ur's Sumerian citizens of 2000 B. C. had doorways arched with bricks set in true voussoir fashion.

HIT BELIEVES THAT IT OCCUPIES THE SITE OF THE GARDEN OF EDEN

The town, on the border between the alluvial and the stone country, stands on a low hill of mud 70 miles from Baghdad, a place of heat, insects, and nauseous fumes from its bitumen wells (see illustration, page 121).



ARAB TRADITION SAYS THAT THE INFANT MOSES WAS SET ADRIFT IN SUCH A "GUFA"

"Round like a buckler and freighted with casks of palm wine," so Herodotus described this ancient river craft of the Tigris and Euphrates. They are circular and basket-shaped, about six feet in diameter, and are woven from willows, coated outside with bitumen. The famous Greek historian and traveler also tells that they floated downstream from Armenia, each bearing a live ass, and that on arrival at Babylon they were pulled apart and the ribs of willow, date palm, and pomegranate sold with the merchandise. The swift current here on the Tigris at Baghdad spins the craft around like a top.

HERODOTUS SAW NATIVES BUILDING RAFTS JUST LIKE THESE 2,400 YEARS AGO

Arabs at Mosul are loading *keleks* to float down the Tigris. The use of such rafts, made of inflated goatskins, held together by poles, and covered with a platform of straw mats, is very ancient in the Land of the Two Rivers, for they are depicted on Assyrian bas-reliefs. They come down to Baghdad laden with wool, pottery, grain, and other commodities. At Baghdad the rafts are broken up, their wood furnishing some of the city's fuel supply. The skins, when deflated, are sometimes sold to harness-makers, but are usually taken back home. Across the river from Mosul is the site of Nineveh. It is best known as the Assyrian capital, but the Sumerians may have lived there before they migrated south to Ur.

substance that still has a certain cohesion—can always be distinguished over the skull and around it.

The six men, perhaps the funeral bodyguard, were ranged in a row against the front wall of the shaft. The women lay in rows across it, and in three corners were buried the principal treasures.

THE FINEST SCULPTURED HEAD OF THE ANCIENT WORLD

In one corner lay a curious object, unfortunately in a lamentable state of preservation. It consisted of a number of wooden poles overlaid with silver, surmounted with copper spear blades, and a central pole inlaid with mosaic of shell, red sandstone, and lapis lazuli, silver plating and gold bands alternately. Along it were shell rings attached to shell knobs. This may have been a collapsible tent, a conjecture supported by the fact that against it lay a number of women less brilliantly attired, in skirts edged with shell rings not unlike those worn by Eastern ballet dancers.

One might well hazard a surmise that beneath the tent was enacted a funerary dance, or even a passion play, to the accompaniment of harps and song, the prelude to the sacrifice, for in the adjacent corner lay a series of no less than four instruments of music, all lyres, of gold, silver, copper, and mosaic. The strings radiated downward from the top horizontal bar into the sounding box. The most magnificent of the four had a top bar of silver and wood, the uprights being decorated with bands of gold, and of red, white, and blue mosaic. The sounding box was edged with a similar incrustation, and the whole surmounted by the golden head of a bearded bull, the finest sculptured head of its kind that the ancient world has ever produced (pp. 114, 116).

If we look at it from the point of view of the goldsmith, we behold an object of a technique still unsurpassed in our age. To the sculptor it bespeaks a feeling for life and form that reveals the highest qualities of glyptic art, while to the historian it provides a grim witness to the scenes of sacrifice and death whose awful tenor we may but dimly conceive.

In another corner of the pit lay an object never before unearthed in the round. It consisted of a pair of rampant rams browsing on a golden thicket. These were broken and crushed by the weight of soil piled into the shaft immediately after the depositing of the offerings; but, like the harps, they are being carefully restored to their original shape. One of them now stands to within a few millimeters of its original dimensions (see page 94).

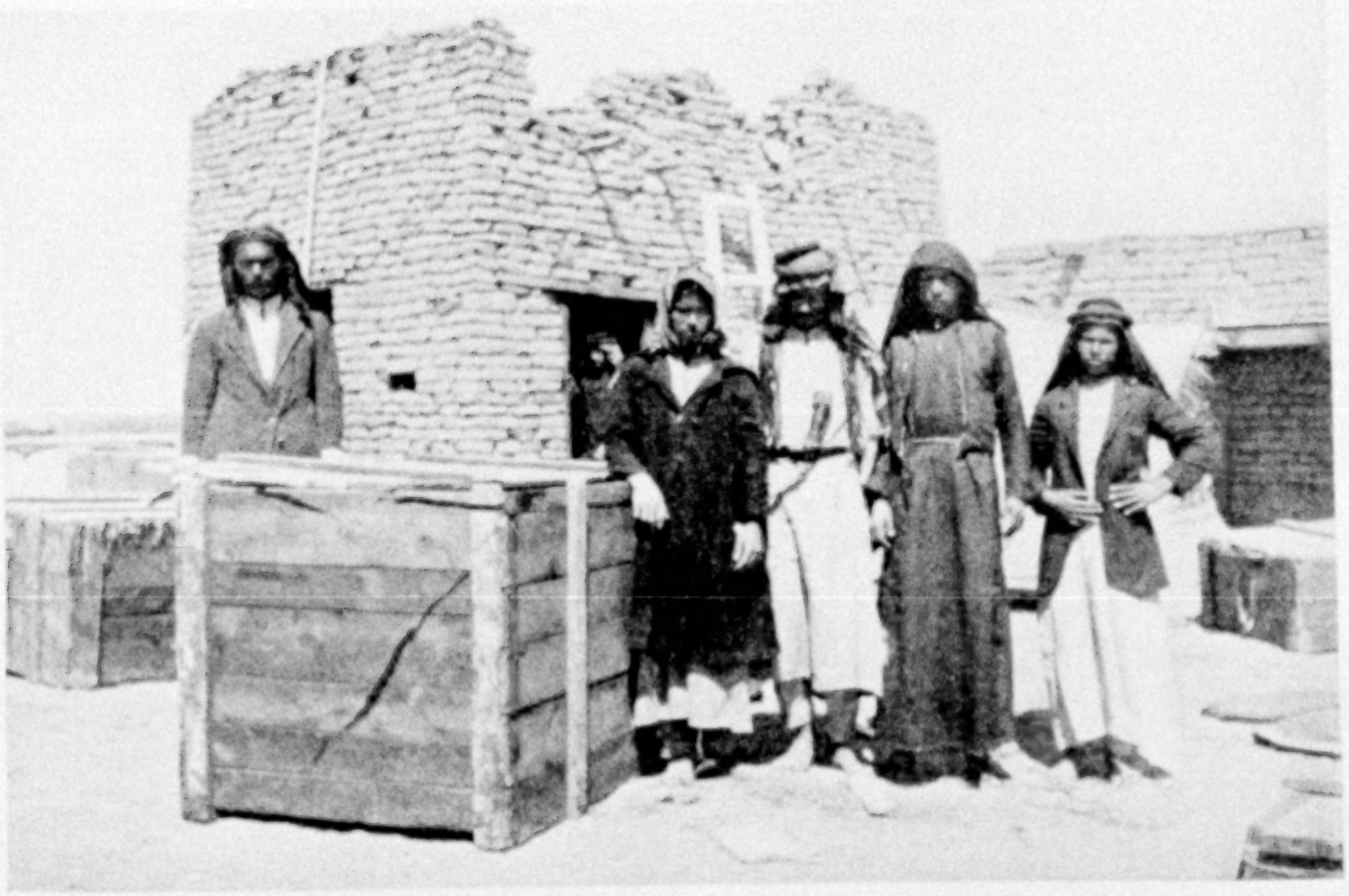
The rams are linked to the thicket by silver chains and their forelegs rest in the crook of a branch. The bodies consist of a wooden core overlaid with a fleece of shell; the mane, beard, and horns are of lapis lazuli, the heads and legs of gold, and the belly overlaid with silver. This heraldic symbol, well known from engravings on exquisite shell plaques, reminds us irresistibly of the ram caught in the thicket, vouchsafed by God to Abraham as a substitute for his son Isaac.

These two graves, so rich in human victims typical of the most important burials, raise interesting problems. First of all, were they royal burials? If so, where was the king? In any case, why is there such a scarcity of kings? Secondly, why this predominance of women, and what, exactly, was their business in the graves?

These are questions that still baffle scholars. For the present, they can receive only conjectural answers, chiefly because of the extreme scarcity of literary material for the period. The Sumerians, in spite of their advanced technical products, had not yet developed the historical sense; they have given us only a few names of the occupants of the graves, and even later tradition has only the most meager information about these early practices.

ANCIENT KINGS OF UR FEARED TOMB ROBBERS

As to the kings, we must remember that the earliest and most imposing of the tombs, the vaulted chambers built of limestone, have all been plundered, and the plundering in many cases took place very shortly after the burial. It is, therefore, probable that the kings' immediate successors took all possible precautions to avoid disturbance, and may well have been content to be buried in an unobtrusive manner, so that the later tomb robber, whether common pilferer or archeologist, could not identify him.



PACKERS OF A SEASON'S FINDS AT UR

Unearthing ancient treasures is only half the battle. The most elaborate care has to be taken in packing to protect articles, often extremely fragile, against breakage.

For these Sumerians believed that if the body was disturbed the soul was disturbed, too. Even in later times there was a pathetic fear of the disturbance of a man's handiwork, so that kings would bury in the ground curses on those who should in after time efface their monuments. The fact remains that these graves, plundered and unplundered, have all the marks of royalty about them, even though royal names may in themselves be very scarce. But nothing has ever been found in Mesopotamia that so much resembled a royal cemetery as this one.

Again, there is the possibility that in some of these shaft graves the human and even the material victims may have been offered as a substitute for the king. In the great shaft grave that contained 68 women and only 6 men, we remarked that the pair of rams reminded us of the ram caught in a thicket, sent by God to Abraham as a substitute for his son Isaac (see text, page 128). Why, then, did the king require sacrifices? And why did he require women to accompany them?

Now, we know that in Sumer from the earliest days god and king were virtually identified, and it may be that, as among animistic worshipers all over the world, so, too, it became incumbent on the Sumerians to sacrifice a king for the good of the community. Two things are certain: that in the earliest rites there was a divine paramour whose conjugal relationship with the king was as much part of his religion as it was of his physical welfare, and that, similarly, the sacrifice of women was connected with these mystic rites.

Herodotus, the Greek historian and traveler, who visited Babylonia in the fifth century B. C., tells of the nightly intercourse of king and priestess in the shrine on top of the Tower of Babel, of which the Ziggurat at Ur is an earlier prototype. The queen found in one of the royal chambers two seasons ago lay in the embryonic position, and there is every reason to believe that, as in these burials material needs were supplied as far as possible to afford a continuity of comfort in the world to come, even so physical and religious rites were continued, too; for what

was more essential to the welfare of the king than his harem?

ANIMAL SACRIFICES SUBSTITUTED FOR HUMAN

But, as was to be expected, the expensive and barbarous method of sacrifice was abandoned at an early period. Already by the first dynasty of Ur, in 3100 B. C., the practice seems to have died out. Whereas in the domed grave animals and humans were sacrificed together, in later times the animals assisted alone at the funerary sacrifice. There is a significant text from the later Babylonian liturgy which says: "The lamb is the substitute for humanity; he hath given up a lamb for his life; he hath given up the lamb's head for the man's head!"

It is strange that Babylonian tradition contains no reference to these early holocaustic practices. A casual reference in a later Babylonian text speaks of the sacrifice of a man's son in case of the nonfulfillment of a contract.

But there was one late ceremony enacted in Babylon which was a possible relic of the predynastic custom. Berossus, a Chaldean priest, writing some time in the third century B. C., refers to a Babylonian festival called the Saccæa, adopted by the Persians of the Achæmenid dynasty. Both men and women then spent the night in an ecstasy of drink and debauchery. But, more to our purpose, we shall translate from a passage preserved in the Greek of Dio Chrysostom:

"Taking one of the prisoners who has been condemned to death, they set him on the throne of the king and they invest him with royal raiment, and for the days of the festival he enjoys debauch and the concubines of the king, and no one hinders him from acting after his own desires. But thereafter they strip him of his raiment and he is beaten and hanged!"

Sir James Frazer, the distinguished anthropologist, considers this a relic of bygone days, in which the king himself was sacrificed to make way for a younger substitute. Indeed, it is incredible that anyone should have been allowed to violate that holy of holies, the Eastern harem, were it not for some all-powerful religious reason.

Such slender threads of evidence are all we possess to enable us to weave the underlying texture; so we must bide our time. Further excavation can alone help to unravel the meaning of these intriguing, baffling problems.

WOMEN IMPORTANT IN RELIGIOUS RITUAL

One more fascinating phenomenon in these burials is the predominance of women. The discovery of these graves which contain a majority of women gives rise to three possibilities. They may have represented a fertility sacrifice whose implications are unknown. They may have contained the king disguised as a humble individual, the better to avoid disturbance. They may have contained a substitute for the king, so that he might, as it were, bury his old age and his harem and renew his house and his virility.

At all events, throughout Sumerian history women occupy a position of authority and independence remarkable among orientals. Monogamy was maintained in principle if not in practice, for the importance of replacing the family stock made concubinage permissible. But the legal wife's status was jealously guarded. She had authority to control her own slaves, to engage in business of her own, to act as a witness in the law courts, and to run her husband's estate in his absence. In general, if we compare her disabilities with those of a Semitic woman, we must give extreme credit to the Sumerian system.

And what was the reason for this independence? Strange as it may seem, the Sumerian hecatombs of women afford a clue. The importance of the woman in Sumerian religious ritual was paramount, from the high priestess who enjoyed union with the king on the Ziggurat shrine to the colleges of priestesses that were so remarkable a feature of religious life. In fact, their function at the religious sacrifices was perhaps the price they had to pay for a position of honor and esteem in a great oriental society.

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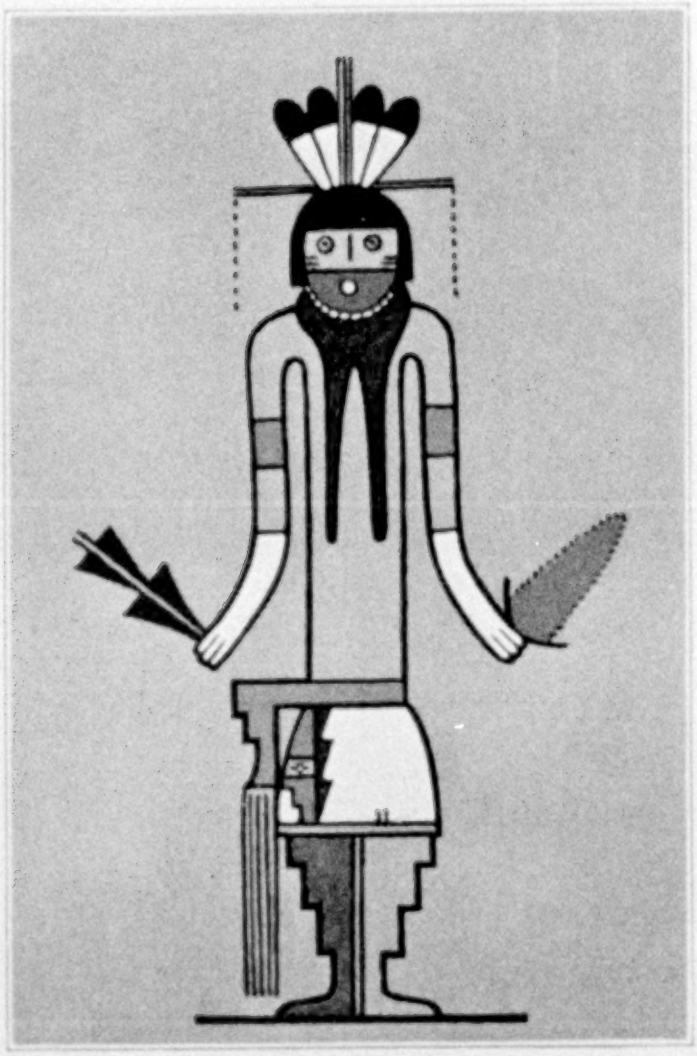

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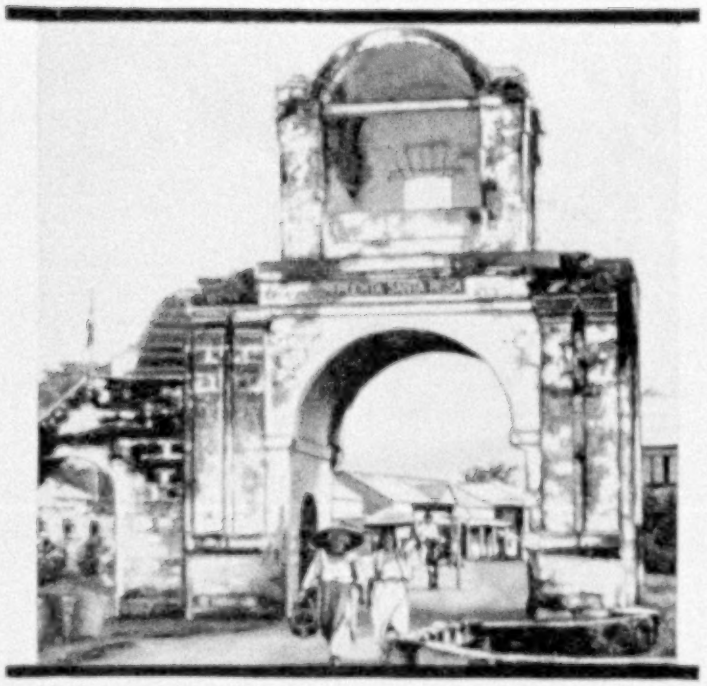

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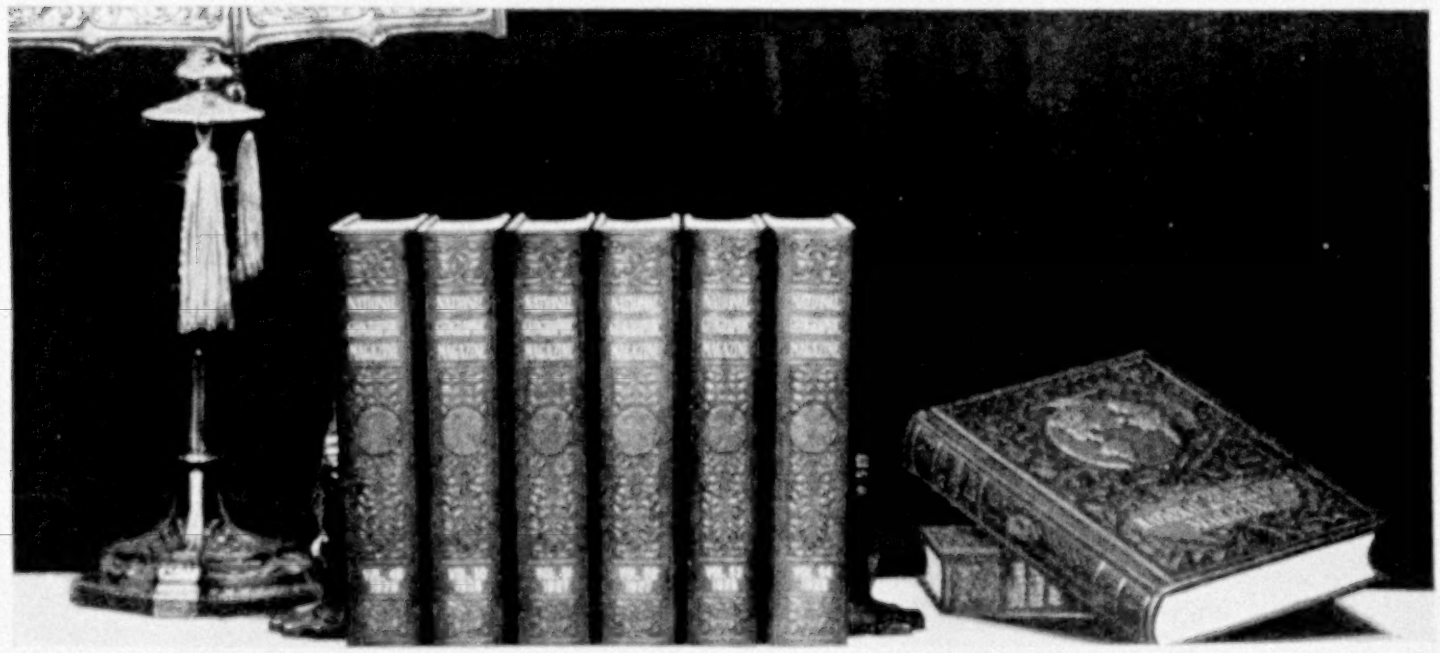

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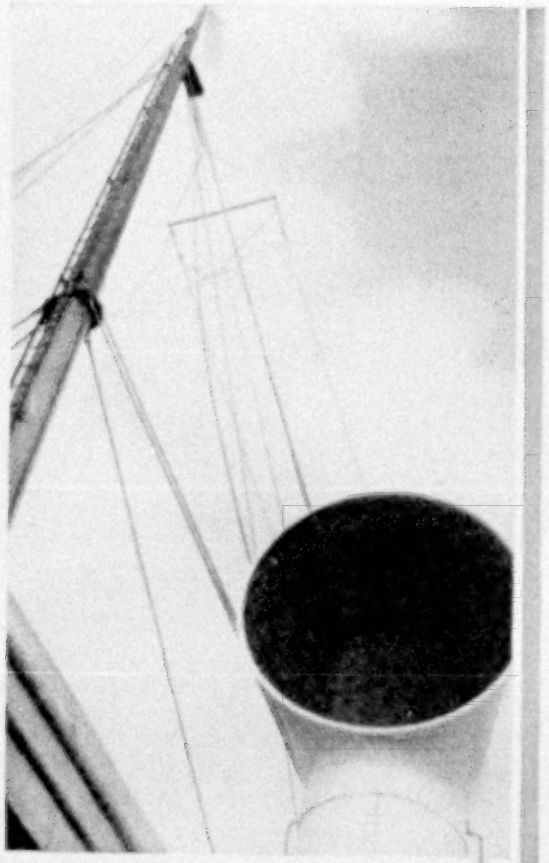

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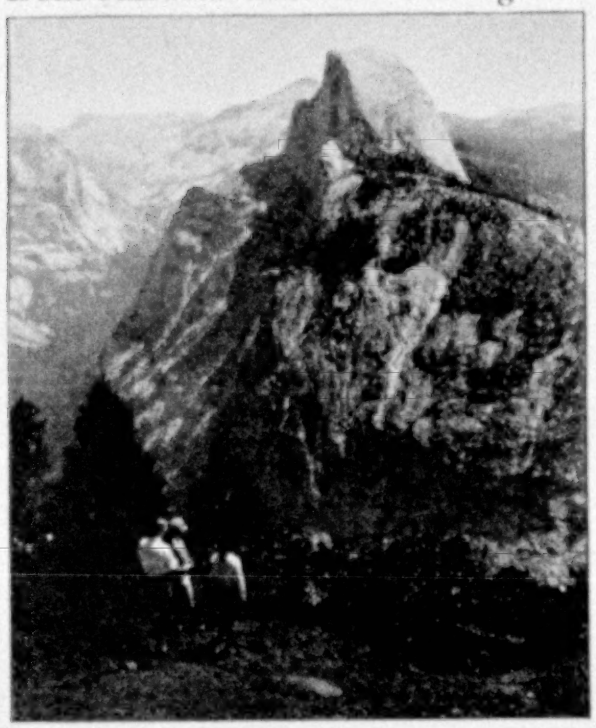

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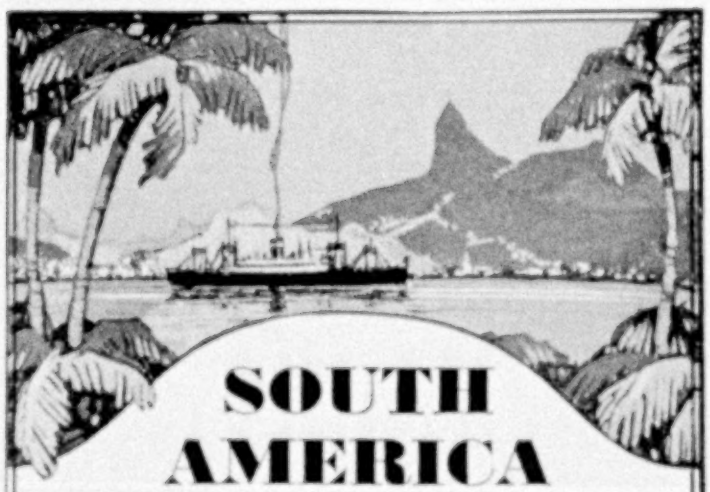

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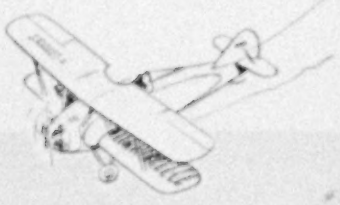

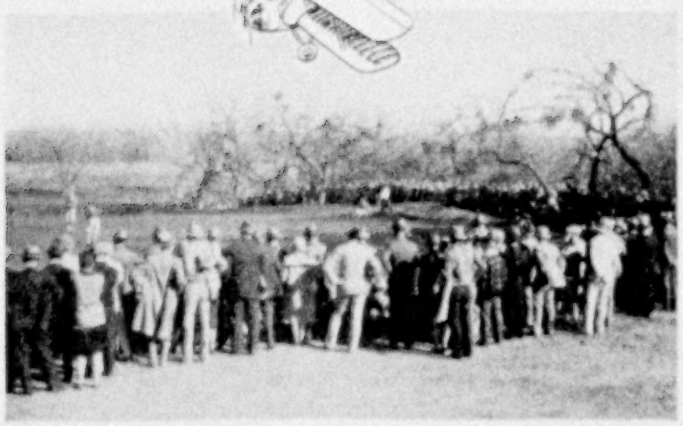

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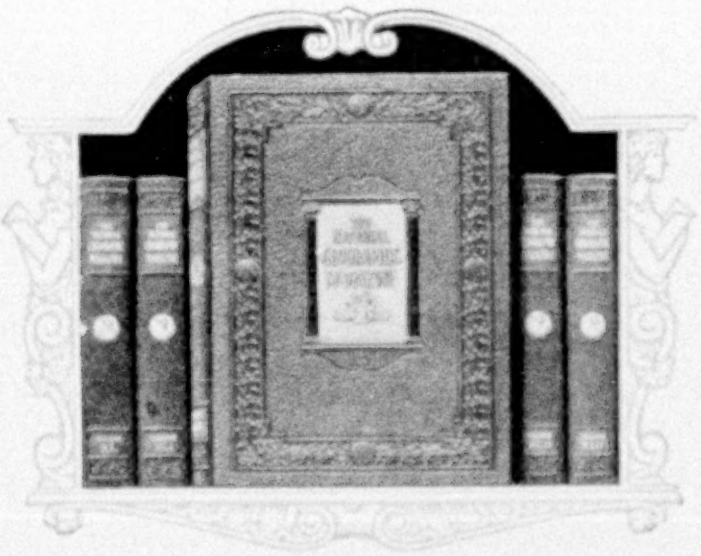

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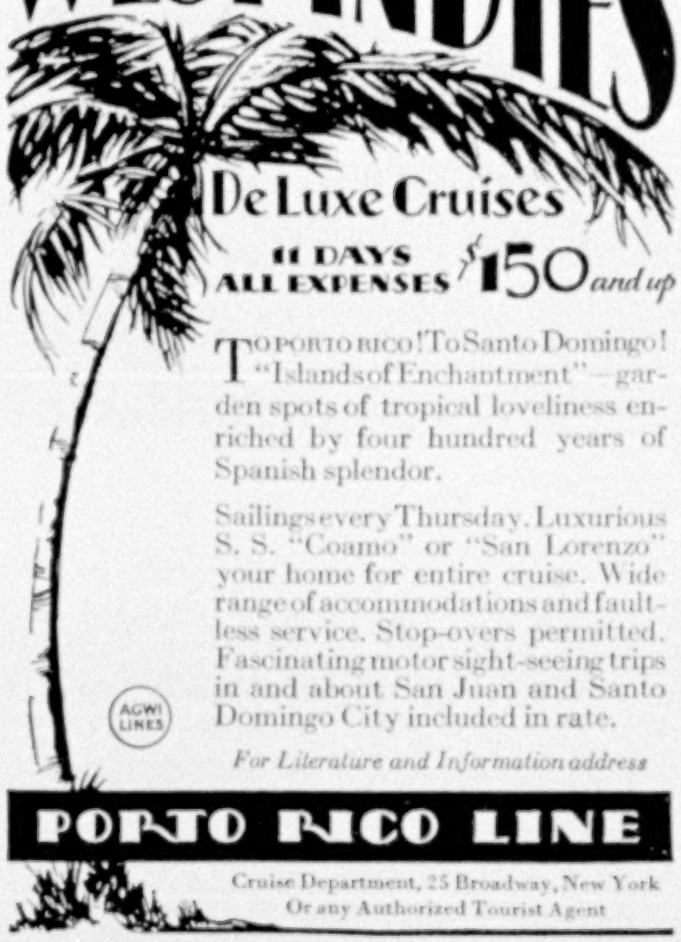

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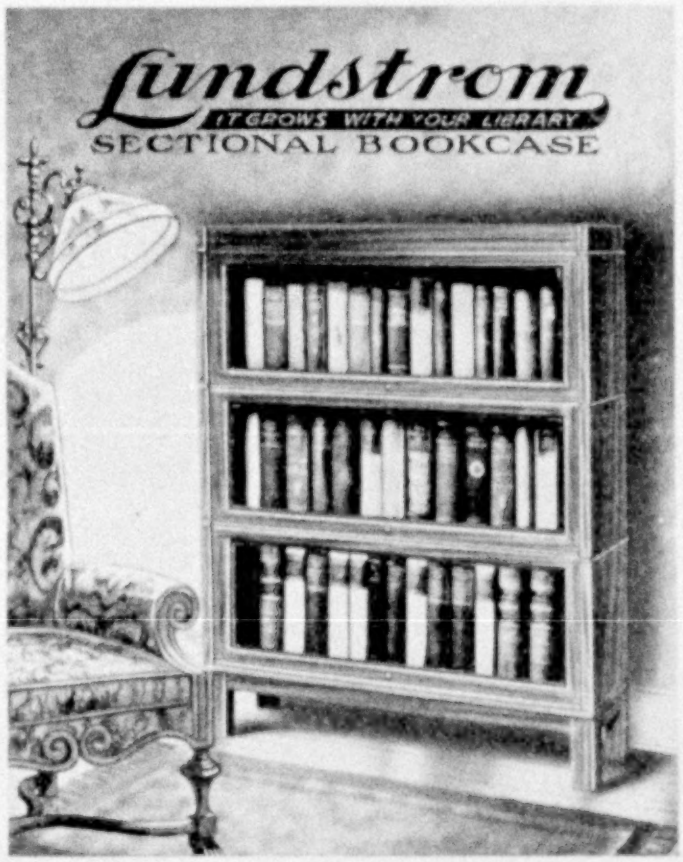

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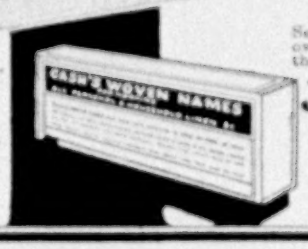

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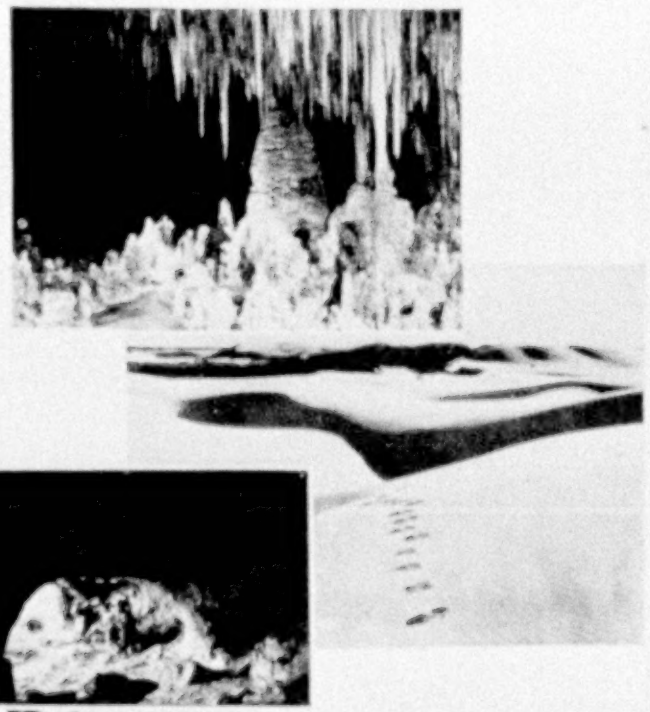

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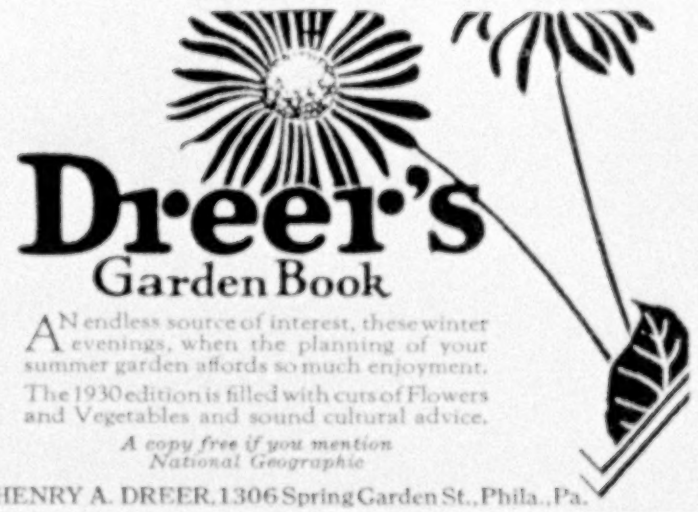

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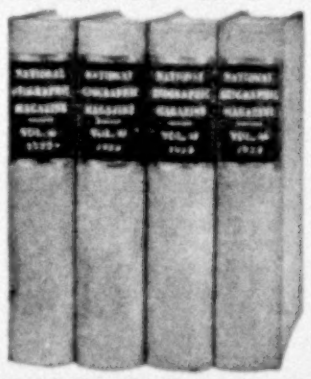

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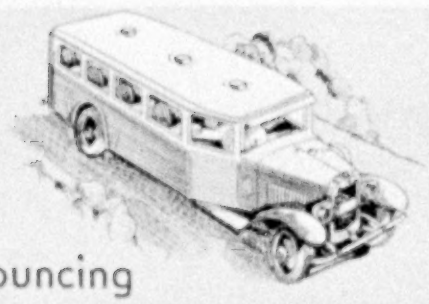

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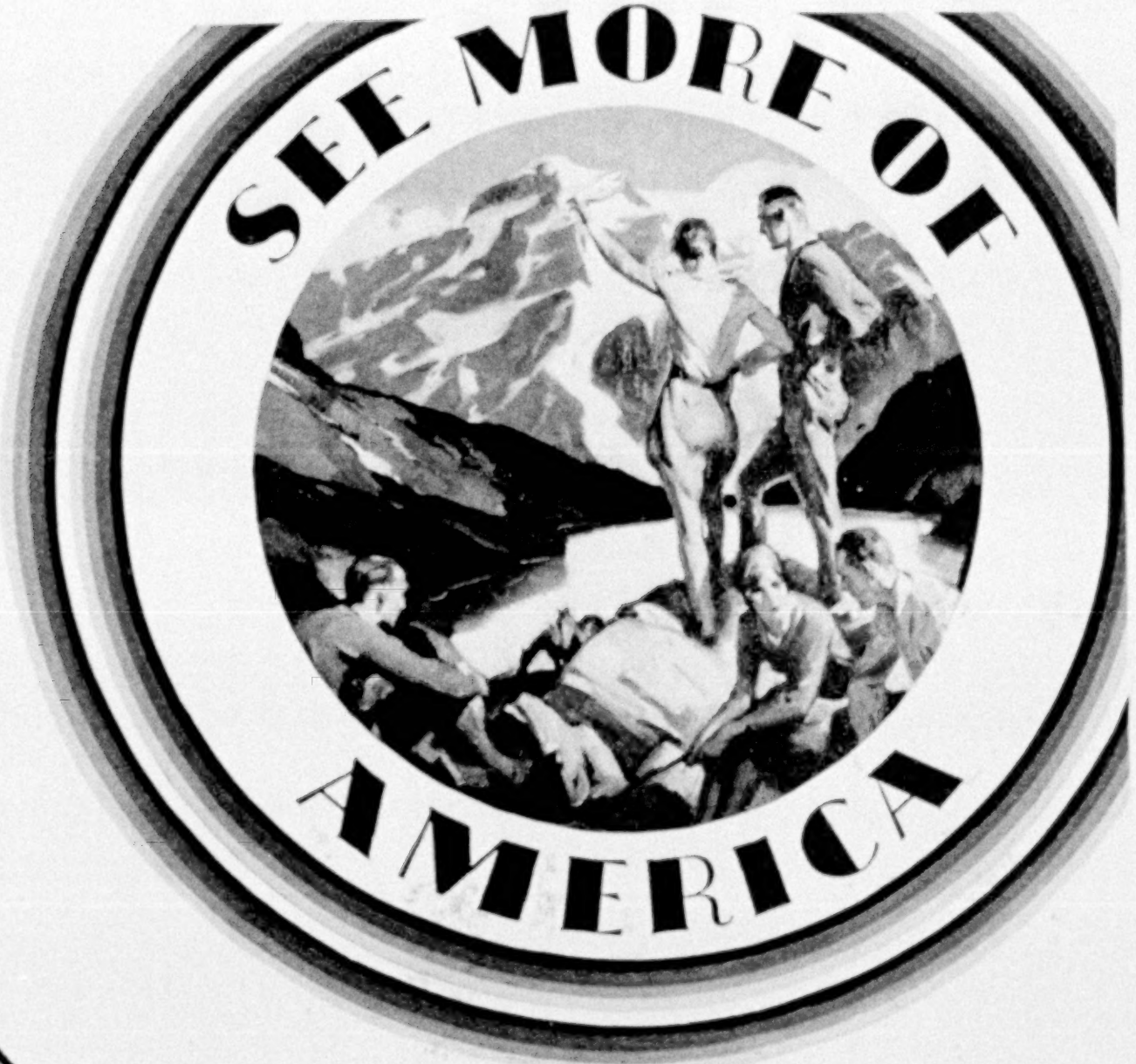

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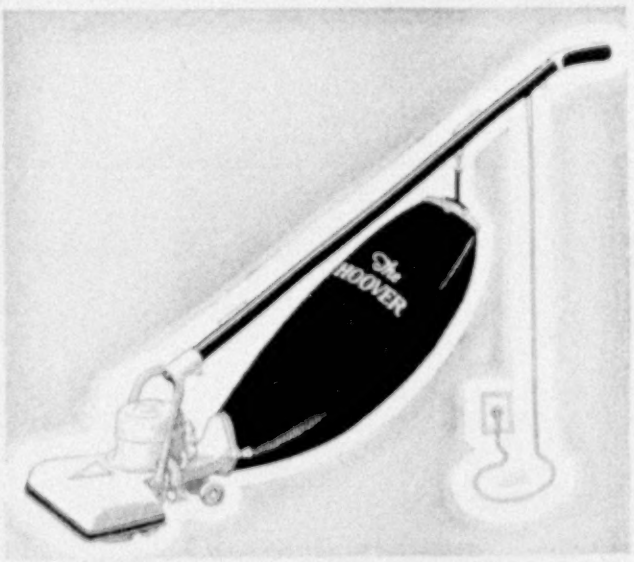

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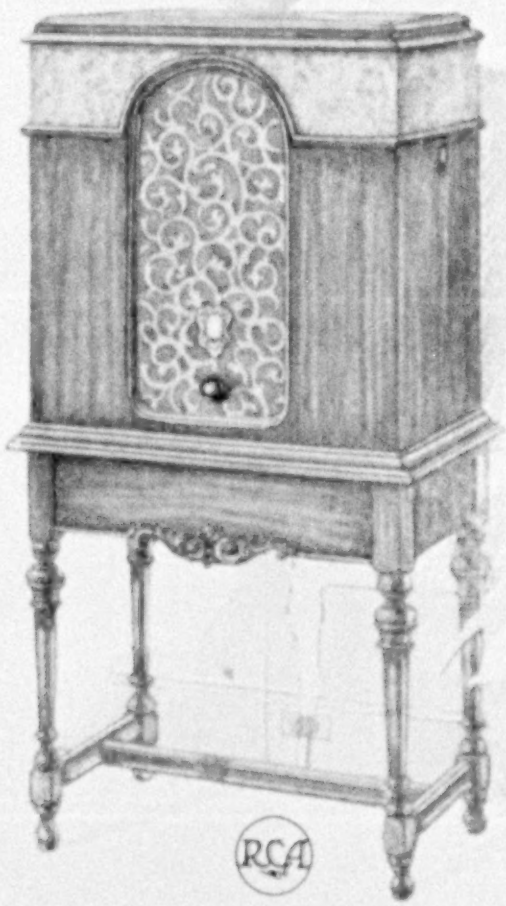

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